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Editorials.

THE NATIONAL VETERINARY ASSOCIATION.

THE annual meeting of the National Veterinary Association has been arranged this year, for the second week in August, at Brighton. The provisional committee has made arrangements for papers which should provide a fund of useful information and afford good bases for discussion. In the first place, Dr. Murray has promised to read a paper on "Cancer in the Domestic Animals." Dr. Bashford, as our readers probably know, is very closely associated with the Imperial Cancer Research Fund, and consequently during the past few years he has probably had more to do with the pathology of cancer than anybody else. Hence we are looking forward to his paper as that of a great specialist in the hope of learning much. The second paper down for discussion is to be produced by Mr. Stockman, of the Board of Agriculture, and his subject is "Redwater." It is only a very few years ago—in 1904, we believe—that a paper on this subject was discussed by the National Veterinary Association at the second Dublin meeting; but a lot of work has been done since then in this connection. No doubt Mr. Stockman has a lot of information on this subject to give us. He has had great experience of the disease both in South Africa and at home, and he will earn the gratitude of

country practitioners in the "Redwater districts" if he can suggest any definite improvements in the present more or less unsatisfactory methods of combating the disease.

"Tuberculosis in its Relation to Meat and Milk" will be introduced for discussion by Mr. J. Lloyd, of Sheffield. As an inspector of meat and milk Mr. Lloyd is well known, and he is sure to provide a paper worthy of the National. The subject is so important that it needs nothing from us to emphasize it. The remaining paper, on "Skin Diseases in Dogs," is to be presented by Mr. G. H. Livesey. The growing importance of canine practice will endow this paper with special interest, and will undoubtedly lead to a well-sustained and profitable discussion. Thus it will be seen that all tastes are to be catered for, the general practitioner, whether in town or country, and also the municipal inspector.

The social aspect of this meeting is not of small importance, and it is now the custom for many practitioners to take their holidays at the time of the National. One cannot speak too highly of this aspect of the meetings, since the more we meet in social intercourse the better we shall know each other, and the greater will be the *esprit de corps* of the profession.

The entertainment committee are providing an excellent programme, in which our ladies, be they wives, sisters or daughters, are welcome to take part. The annual dinner will be held on the evening of Tuesday the 11th inst.; there is to be a reception and garden party by our President, Mr. R. Roberts, of Tunbridge Wells, on the Wednesday, and Thursday will be devoted to an excursion to Arundel Castle and up the River Arun in motor-boats at the invitation of the Southern Counties Veterinary Medical Society. Surely an excellent programme, which, together with the usual attractions of Brighton, with its bracing atmosphere, will appeal to a great many members.

We trust that the members of the National Veterinary Association will go to Brighton in large numbers and show their appreciation of the work being done for their benefit and enjoyment.

THE ROYAL COLLEGE OF VETERINARY SURGEONS.

WE are very glad indeed to see that the Council have re-elected Sir John McFadyean to the Presidentship. It is more than a compliment to Sir John, who has done so much good work for the profession; it bears on the face of it a determination on the part of the Council to proceed with the proposed new Bill. It would certainly have been a great mistake to change presidents at this critical period, and in view of the very moderate speeches of some of the opponents to *parts* of the Bill, we have hopes that an agreement will soon be arrived at, so that the Bill may be presented with a united front. The principle of the Bill is apparently agreed upon by all; it is a pity that the question of its administration should cause so much trouble. In any case, we hope to see it become law in the near future.

General Articles.

THE ADMINISTRATION OF CHLOROFORM TO HORSES IN THE STANDING POSITION.

BY C. ROBERTS, M.R.C.V.S., TUNBRIDGE WELLS.

IT is not my intention here to debate upon the "pros and cons" of anæsthesia during operations on horses, but I would like to refer to the humanitarian aspect of it. In my opinion anæsthesia is not half frequently enough employed in our operations, and animals have to undergo a great deal of unnecessary suffering. The very common operation of castration is one which I regard as frightfully painful, and yet how seldom is an anæsthetic used during its performance on colts? Moreover, it is an operation which lends itself perhaps more than any other to the use of chloroform.

I wish to draw special attention to the almost entire absence of risk from injury to the animal during the administration of chloroform while in the standing position. Perhaps that is contrary to what might be supposed. One might expect that while a colt is tumbling and rolling about in a semi-intoxicated state, he would be certain to injure himself. But it is well known that drunken men and babies rarely come to any harm from falling down; and so it is with horses that are half anæsthetised. The explanation, of course, is that there is muscular resistance offered to the fall, no efforts to save themselves, and so no sprains or broken bones. Every colt that has been castrated in our practice for some thirty years past has been chloroformed in this way, with one exception. That was the case of a five-year-old which had never been handled, and after attempting for nearly two hours to get the inhaler on, and failing to do so, we decided to cast him with

side-lines. We accordingly got him down, and partly fixed, when a violent struggle resulted in a fractured femur, and he was shot forthwith. When chloroform has been used in the first place, I have never known of a broken leg, or sprained back, or any other injury.

Then I would say that as regards the ease and safety to the operator and his assistants, the old method is not to be compared with that in which the chloroform is administed standing. There is not nearly the amount of pulling and struggling on the part of the man, nor the resistance offered on the part of the animal, nor any of those evidences of acute agony which are evinced by the unanæsthetized horse during castration.

Modus Operandi.—For this method of administering chloroform it is well to have plenty of room, such as a paddock, though cobs and ponies may be anæsthetized in loose boxes. In such cases, however, there may be some risk if the walls are not padded. The inhaler we use is a simple but effective one. It is similar to the ordinary leather muzzle used to prevent horses eating their bedding, but it is made deeper by means of thin leather sewn round the top edge. This thin leather may be drawn tightly round the horse's face by means of a strap passing through loops. A sponge is enclosed inside the muzzle. There is only one hole communicating with the exterior, and this can be closed with a wine cork. We first secure the animal by means of a cart-rope round his neck behind the jaw with a fixed (non-running) noose, and then put on the muzzle. This we prefer to do in the yard or loose box, and the colt is led out to the field or paddock. The chloroform is then poured through the hole and the cork firmly inserted. We commence with ʒvi. for yearlings or ʒi. for older animals, the animal receiving a minimum of air. After the chloroform is inserted the horse usually does one of three things: (1) He may rear and turn a somersault backwards on his poll if there are not two or three men holding the cart-rope to prevent him; (2) he may walk or trot gently round in a circle until he staggers and goes down; or (3) he may remain in the same place, gradually sitting down on his haunches like a dog, when he can be easily pulled over, on the near side for preference. No restraining with ropes is then needed beyond fixing a limb or limbs out of the operator's way. When the animal is well under the chloroform the cork is removed and air admitted. When there are signs of returning consciousness more chloroform is introduced and the air supply again cut off. For castration we let the colt remain lying on his side, and draw the upper hind limb forward by means of a single side line. By this method we have experienced no difficulty with horses of any age up to 13 and 14 years.

We strongly recommend this humane method for castrations and other operations which lend themselves to it. "Once tried, always employed," may be said of it. Owners of horses who know of it will not have the "standing operation" or any other performed on their colts, and will willingly pay the extra fee for the anæsthetic.

DOURINE.

BY MAJOR FARMER, F.R.C.V.S., INDIAN CIVIL VETERINARY DEPARTMENT.

In dealing with this disease I intend chiefly to put before you matters affecting the veterinary surgeon in general practice, and therefore will only deal with the inoculation experiments with smaller animals briefly. Dourine is a disease naturally affecting equines, and is caused by a flagellate organism, *Trypanosoma equiperdum*, Doflein, 1901. In France it is called "mal du coit."

The term "dourine" is more generally used, and is derived from an Arabic word denoting dirt.

Geographical Distribution.—It has a wide geographical distribution. At one time it was not uncommon in Spain, and was occasionally met with in France and Germany. At present it exists in South-Eastern Europe (Hungary and Turkey), Spain, Africa, Nigeria, Tripoli, Tunis, Persia, India, Java, Chili, certain parts of the United States and Canada.

History of the Disease.—The organism of the disease was first seen by Rouget in 1894. He made numbers of experiments upon various animals, the results of which were published in the *Ann. Inst. Pasteur*, vol. x., 1896, p. 716. In 1899 Schneider and Buffard (Notes communicated to the Académie de Médecine on July 25, September 19, October 3, and November 21, 1899, January, 1900; *Archiv de Parasitologie*, vol. iii, 1900, p. 124), found a trypanosome in Algeria. They were more successful than Rouget, inasmuch as they succeeded in reproducing the disease in the horse with a virus which had been passed through a dog. Nocard confirmed these results, and since then the *rôle* of this trypanosome in the causation of dourine has been generally admitted. At the beginning of July, 1901, Doflein gave the name *T. equiperdum* to this organism. Almost immediately afterwards Laveran and Mesnil called it *T. Rougeti*, but the former term has been adopted.

Dourine in the Equidæ.

Dourine may be acute or chronic, the latter being the commonest.

Acute Dourine.—Sometimes the disease is acute, and after the plaque stage (to be referred to later) a sudden attack of paralysis carries the patient off. This is more common in the mare. This form may be due to a secondary or double infection.

Chronic Dourine.—There are three stages in this form, and usually well defined.

(1) *Localized Œdema.*—The first signs of the disease in the stallion are visible from the eleventh to twentieth day after coitus. The disease starts with a local œdema at the lower extremity of the sheath. This œdema gradually extends along the lower parts of the sheath to the scrotum and inguinal region. The end of the penis becomes infiltrated, and the horse gets slight erections frequently. The superficial lymphatic glands in the groin become enlarged.

In the mare the symptoms are not so marked as in the stallion. There is a unilateral or bilateral swelling of the vulva, a bright red colour of the vaginal mucous membrane, and a mucoid or viscid discharge, which gradually increases. Vesicles appear which, after healing, leave light-coloured patches (leucoplasia). I have also seen these

on the penis and scrotum. They differ from leucoderma, in that they are defined and circular. In variola equina you also get this after the disappearance of the exanthem. The appetite remains good; the temperature varies from 38° to 38·5° C.; coitus is still possible. About a month after the appearance of the first symptoms the swellings decrease, and become localized to the genital organs. I have seen the swellings disappear almost entirely. There is a tenderness over the loins, and the animal clearly shows signs of debility.

(2) *Plaque Stage.*—This is the stage in which patchy infiltrations occur under the skin, about six weeks after infection. These are very characteristic skin lesions, and can be made to appear at any time after they have once shown themselves. I have seen a good number of cases of dourine, and plaques, when absent, were produced by giving the animal a little more exercise than usual. After twenty-four hours plaques appeared. Long railway journeys and other debilitating causes will bring out an eruption of plaques. I took great care, when purchasing stallions in Spain to give the animal a good deal of galloping, and examining the following day.

Plaques are of different shapes and sizes, viz.: (*a*) Like metallic discs or coins under the skin. The skin is raised and circular, the hair is erected. The plaque is firmly adherent to the subcutaneous tissue. It is really a rigid, flat, circular plaque. The size varies, but it is usually not very large. (*b*) Circular or oval meniscus form. (*c*) A plaque somewhat like the above, but more depressed, and flatter in the centre, almost like a lifebuoy. (*d*) Irregular forms.

There is no predilection seat for plaques, either on the trunk or on the neck. Out of 440 plaques in males and females in India they were distributed as follows: Horse, right side, 11; left side, 95. Mare, right side, 144; left side, 90.

Plaques may appear in the morning, and be gone by the evening. During this stage wasting is a marked symptom, and the patient moves about with very little energy, and drags the hind feet. The inguinal glands become greatly enlarged. Appetite is very good, and often enormous; the eye may be fixed and staring, and affected with keratitis. I have only seen this in two cases. Reflexes are retarded. Temperature 38·5° to 39° C. During this stage sexual intercourse is impossible, and mares generally abort.

(3) *Profound Anæmia and Paraplegia.*—During this stage the mucous membranes are very pale, and wasting is still more marked; appetite is capricious, weakness increased, micturition difficult, and urine thick. Crepitation in the joints and limbs on movement, unsteady gait, reeling of hindquarter, difficulty in rising, and finally paraplegia.

Distribution of Trypanosomes in the Body.—Trypanosomes can be found in the blood taken from the region of the œdematous swellings and plaques. The colourless fluid which escapes immediately after puncturing the œdematous swellings and plaques appears not to contain the organism. The blood-tinged fluid which follows contains the parasite, and the best opportunity of getting them is when the plaque first appears. At the outset of disease trypanosomes are not difficult to find; at later periods, *i.e.*, when the plaques have disappeared, the trypanosomes seem to be less freely distributed throughout the body. Blood examined shows only a few parasites, but this blood is infective when injected into another animal. This proves that

the organism is a blood parasite. The virus does not enter the circulation until five or six weeks after the primary infection ; it may be as long as ten to twelve months, especially if the symptoms be detected early and the patient well-cared for. Lingard is of opinion that plaques are due to circumscribed angio-neurotic œdema, occasioned by the advent of the trypanosome or its developmental form in the papillary layer of the skin. He thinks that a toxin elaborated by the trypanosome produces dilatation of the capillaries, and a localized increased secretion of lymph around. Mott thinks that by analogy with the origin of *herpes zoster* it is an irritation of the posterior spinal ganglia, as these become affected by the noxious agent.

Trypanosomes can be found in the vaginal mucus in most cases sooner or later, and they may be found in the mucus at intervals during the subsequent course. Trypanosomes may be present for months in vaginal mucus without the animal showing any signs of disease.

Pathology.—The chief lesions are found in the lymphatic glands and spinal cord. The lymph glands are much enlarged, congested, and softened, this starting with the glands of the abdomen and hind-quarters. In chronic cases the lymphatic system becomes generally affected. The spinal lesions are most marked in the lumbar and sacral regions. Degeneration takes place, and parts of the cord are converted into a reddish diffluent pulp. In long-standing cases these patches may be 2 in. long. A gelatinous exudate may be formed. Mott has observed the following histological changes: Intense chronic inflammation of the posterior spinal ganglia, most severe in the lower dorsal and lumbo-sacral region, but fairly marked also in the upper regions of the cord. Where the inflammation was most intense the ganglion cells were most affected, in some cases completely destroyed, and their place occupied by inflammatory products. Other changes, similar to those of tabes dorsalis, were found. Throughout the grey matter of the spinal cord the vessels exhibited evidence of chronic inflammation with scattered capillary hæmorrhages. The changes were most marked in the lumbo-sacral region, infiltration and thickenings of the connective tissue septa, infiltration of nerve roots and of the vessel walls with lymphocytes and small round cells. Mott states that the condition simulates an acute syphilitic meningitis in many ways, except that in this case there was only occasional evidence of an obliterative arteritis.

Duration of the Disease.—This is variable, usually it is from two to six months, and may last two years. Lingard says that the *materies morbi* of the disease may remain in the system for four years, just as cattle and camels in India can tolerate the trypanosome of surra or its developmental forms for one to three years.

Characters of *T. Equiperdum.*

This organism is capable of entering the system through the unbroken surface of mucous membrane (Rouget). Absorption by the digestive tracts of different substances rich in parasites has never been followed by infection.

Morphologically it is indistinguishable from nagana and surra. There is less known about the morphology and biology of *T. equiperdum* than any of the other well-known pathogenic trypanosomes. Up to

the present, as far as is known, the biology of the organism differs hardly at all from the other trypanosomes.

Comparing it with nagana and surra trypanosomes it is smaller, and it is said that the vibratile membrane is a little more folded, and that there are no metachromatic granules in the protoplasm, and that the protoplasm stains more faintly. It differs considerably from the other diseases in not being fly-transmitted, and secondly the trypanosomes are rarely or never found in large numbers in the circulating blood; these facts are connected.

The organism varies in length, according to its stages of development.

Measurements of trypanosomes found in the plaque stage of this disease in India are:—

Breed of Horse.	Maximum Length.	Minimum Length.
Arab	35.80 μ	21.77 μ
English	29.30 ,, ...	19.95 ,,
Country bred mares	26.54 ,, ...	14·65 ,,
In vaginal mucus:—		
Austrian Mare..	31.28 ,, ...	16.24 ,,
Country bred mares	23.21 ,, ...	15.63 ,,

Staining Characters.—The parasite stains well with the Leishman or the Giemsa stain. I have always used Leishman except when the smears have been sent by post, and are about two or three days old; then I find Giemsa is the best.

With Leishman stain the organism may stain blue, light blue or pink, *i.e.*, the protoplasm and the remaining portions lilac or *dark-reddish pink.* When working with Lingard he showed me a peculiar character which trypanosomes have of staining; for instance, in surra at the commencement of a crisis, and up to the time the temperature began to fall, the trypanosomes stained blue, after that the blue colour faded away to pink towards the end of the crisis. In dourine this is not so well marked. I explained this fact to Sir John McFadyean, but he did not appear to attach importance to it. I think this peculiar staining can be attributed to the organisms degenerating.

Individuality of Dourine.—That dourine is a special disease has been proved by Pease, Nocard, and Lignière. Pease immunized a buffalo against dourine, and then found it susceptible to surra.

Mesnil and Rouget immunized a horse against the virus of Schneider and Buffard, and then found it insusceptible to the virus of Rouget. The latter result proves the identity of the organism found in horses suffering from dourine.

Mode of Propagation.—Dourine is transmitted by coitus, and in this respect, as well as in several others, it resembles syphilis. The virus in both cases has the power of penetrating the intact mucous membrane. Dourine is due to a trypanosome, and syphilis to a spirochæte, the *Treponema pallidum* of Schaudinn. Diseased stallions may infect the majority of mares covered by them. One may say that 85 per cent. of mares exposed to infection become diseased. Infection in any other way is very rare, and doubtless always results from direct inoculation. Nocard and Leclainche observed in geldings and in old mares this disease of the genital organs transmitted through the medium of grooming instruments, such as sponges, and by means of litter.

Rabinowitch and Kemper state they succeeded in transmitting dourine from rat to rat of the same sex by means of fleas.

Treatment.—Trelut obtained good results with arsenious acid (3 to 6 grammes a day) either alone or in conjunction with oil of turpentine or reduced iron (6 to 9 grammes). Blaise also recommended arsenious acid or arsenite of soda, together with arsenite of strychnine. Arkalengsky and Novikoff cured stallions of dourine by subcutaneous injections of sod. arsenite or cacodylic acid. Marchal says that he cured them by injecting subcutaneously cacodylate of sodium. Pease did not get this result. I saw Pease's experiments, and am inclined to believe more in his results. Trypan red and arsenic were used at Mukhtesar (Lingard), but with no beneficial results. Rouget tried rabbit's and dog's serum, which also proved useless as a curative. Atoxyl is now being tried, and there are hopes of it being a specific, since it is so useful in other protozoal diseases.

Prevention is better than cure, certainly, and until we find a curative agent, diseased mares should be destroyed, and stallions castrated. This is now being done in India. Donkeys should be particularly well examined, as on the Franco-Spanish frontier the disease shows itself every year, and has been traced to the Spanish ass covering mares. Should the mares not hold to the jack, they are put to a stallion; then the disease spreads. Cleanliness should be observed in stables and surroundings. All imported animals (stallions and mares) should be segregated for at least a month.

Animals Susceptible to the Disease.—Dogs, rabbits, rats, mice, buffaloes, and monkeys. Evidence regarding the ox is contradictory.

Animals Insusceptible to the Disease.—Birds, fowls, pigeons, sparrows, bats, pariah dog in India, cold-blooded animals, snakes, lizards, and frogs.

Books and correspondence referred to besides those already mentioned: McFadyean's Notes, Post-graduate Course; Laveran and Mesnil; Minchin on "Sleeping Sickness" (*Microscopical Journal*).

In conclusion, I have to thank Dr. Lingard and Colonel Pease for all the cases and experiments they have so very kindly shown me, and Sir John McFadyean for all he has taught me during the Post-graduate Course. Professor Mettam has also helped me in our discussions on trypanosomiasis in general.

FOWL CHOLERA.[1]

Fowl cholera is a highly infectious disease, which, though comparatively rare in this country, has caused serious loss to poultry keepers on the Continent of Europe, in North America, and in South Africa. It frequently assumes an epidemic form, and in such cases often more than half the stock have succumbed. The disease affects not only fowls, as its name implies, but also geese, ducks, pigeons, pheasants, and some wild birds, such as sparrows and finches. Rabbits can be inoculated with the disease, but the larger domestic animals are not susceptible to the complaint.

[1] A leaflet issued by the Board of Agriculture and Fisheries.

The cause of the disease is a minute ovoid bacillus, which is found in the blood, organs, and contents of the intestines of the infected animals. It passes into their droppings, and so is taken up in the food or drinking water of the healthy birds. Occasionally the disease is introduced into a flock by the purchase of infected birds, by infection picked up at poultry shows, or by birds being put into contaminated crates belonging to dealers or other persons. The microbe, however, is very easily destroyed by a weak solution of carbolic acid, or sulphuric acid. It also dies after an exposure to sun and air.

Symptoms.—The period of incubation is very short, in some cases not more than eight hours, while it rarely exceeds sixteen. Fowls that have pecked the dead body of a comrade have been known to develop the disease in twenty-four hours. The disease takes two forms, the acute and the chronic. In the first case, the course of the illness is very rapid, and it frequently happens that no symptoms are observed, the bird dying before it is noticed as being ill. It may collapse in its walk, or fall from its perch to the ground and die, after giving a few flaps of its wings. But the symptoms when they are noticeable are as follows: Affected birds become depressed, huddle themselves together and hide their heads under their wings. The feathers become ruffled, the wings and tail droop, and the birds sway from side to side or stagger. The appetite is lessened, while thirst is greatly increased. There is a discharge from the eyes, nose, and beak, and the comb and wattles turn bluish red. The most marked symptom, however, is diarrhœa. The evacuations are frequent and watery, being white or yellow at first, and becoming greenish and fœtid as the disease progresses, while the feathers round the hind parts become matted together. Except in the specially acute form mentioned above, the disease lasts from one to three days, though cases are on record where the illness was prolonged for a week. The birds usually die in a state of stupor or convulsions. The death-rate in acute cases is very high, sometimes reaching even 80 or 90 per cent.

In the chronic form the more violent symptoms are not present, but the bird becomes thin and bloodless, and suffers from constant diarrhœa. Sometimes there is a breaking out on one or more of the joints, and the inflammation then set up naturally retards the recovery of the sick bird. Towards the end of an epidemic, however, milder cases occur, among which there are a greater number of recoveries. Birds which get well acquire a certain amount of immunity, and if they thrive are valuable for restocking purposes.

Appearance after Death.—In ordinary cases the only marks visible to the naked eye will be found in the intestinal tract, the contents of which are watery, frothy, and sometimes bloodstained. In the intestinal wall, and particularly in the mucous membrane, are formed patches of clotted blood, and areas of congestion ranging in colour from red to purple and black. The liver and spleen are usually enlarged, while in some cases the lungs are consolidated. In some places the mucous membrane may be destroyed, and in others patches of yellow exudate may be found. It must be remembered, however, that there are other poultry diseases with which it can easily be confused by the inexpert, and that in certain cases a microscopical examination is necessary.

Precautions.—(1) All newly-purchased birds should be isolated for a day, and the same course should be adopted in the case of birds

returning from a poultry show. (2) Crates and packing material should always be disinfected, and care should be taken to secure an uncontaminated supply of food and drinking water. (3) When disease appears, all infected birds should be strictly isolated, and healthy ones should be moved to fresh ground. The infected runs and pens should be sprayed with a disinfectant, such as a 5 per cent. solution of carbolic acid, or 2 per cent. of commercial sulphuric acid in water.

Remedy.—There is no practical medical treatment which can be advised for diseased birds. A protective serum is in use on the Continent, but the small value of poultry renders the extensive use of this remedy too costly, except perhaps in the case of valuable pedigree birds.

Fowl cholera is a notifiable disease in some Continental countries, and English poultry keepers wishing to sell stock in such countries would be obliged to give a guarantee of freedom from infection.

WHITE DIARRHŒA OF CHICKS—WITH NOTES ON COCCIDIOSIS IN BIRDS.

BY GEO. BYRON MORSE, M.D., V.S., ASSISTANT IN BACTERIOLOGY AND PATHOLOGY PATHOLOGICAL DIVISION U.S. DEPARTMENT OF AGRIGULTURE.

INTRODUCTION.

POULTRYMEN affirm that where white diarrhœa prevails it kills from 60 to 75 per cent. of all chicks hatched. Hence the necessity for painstaking research that the cause may be demonstrated and prevention or cure found. To this end many and extensive investigations have been instituted; great poultry plants have furnished material, their own experts making careful study of the technique of hatching and rearing chicks; agricultural colleges and experiment stations have faithfully experimented with poultry methods; bacteriologists, with their microscopes and culture media, have lent their aid. Thus the cause has been sought and supposedly found in the barometric conditions of incubators, in the temperature of incubator nurseries and brooders, in the organism of the chick itself, the unabsorbed yolk, in dietetic errors and digestive disturbances, and in the ever-present bacteria. But, unfortunately, cases of white diarrhœa persisted when none of these conditions obtained. As a single instance in point, the writer has often laid out a string of chicks dead from this disease and demonstrated that only about one-half of the number had unabsorbed yolks.

When more than a year ago Dr. John R. Mohler, chief of the Pathological Division, placed the writer in charge of investigations in poultry diseases, and suggested immediate study of so-called "blackhead" in turkeys, the writer demonstrated in the intestines of all turkeys so affected the presence in large numbers of a protozoan organism, *Coccidium tenellum*, thus establishing as a basis for the study of avian diseases the existence in this country of a microscopic parasite long recognized in Europe as most virulent and destructive for birds as well as mammals.

As time passed on there was received material from numerous

epizootics among turkeys, chickens, ducks, pigeons, and various species of wild birds in captivity, exhibiting the lesions usually diagnosed as gastro-intestinal or intestinal catarrh, of non-bacterial but probably of dietetic origin, all of which revealed the presence of a considerable number of *C. tenellum*, accomplishing their damaging work upon the lining membrane of the intestines. In the early summer cases of "white diarrhœa of chicks" began to come into the laboratory, and microscopic examination of the contents and walls of the greatly distended and necrosed cæca, or blind intestinal pouches, brought to light the destructive invasion of the lining cells by this minute but malignant micro-organism.

Accurate researches in subjects of such wide-reaching import necessitate much time in experimentation in order to establish all points involved in a successful war against so subtle a foe. However, the Pathological Division is receiving, both from scientists and poultrymen, numerous letters asking for the fundamental facts of our investigations, and it hardly seems just to withhold this knowledge pending the carrying out of experimental studies, many of which could be undertaken on a far larger scale by poultry plants and experiment stations. Hence this preliminary report.

Description of the Disease.

White diarrhœa (typhlitis coccidiosa) of chicks is an inflammation, of varying severity, of the cæca, or blind intestinal pouches, caused by the presence of *C. tenellum*, an intracellular parasite belonging to the class Sporozoa, of the phylum Protozoa, the lowest division of the animal kingdom.

This disease claims as its victims mostly chicks between two and five weeks of age. The symptoms are dulness and weakness, accompanied by a white, pasty, fæcal discharge. In this discharge may often be detected by the microscope large numbers of circular, sometimes slightly oval, cysts 12 to 25 μ in diameter containing granular matter which may fill the cyst or may be contracted to occupy only a small portion of the cavity. These are the permanent cysts of *C. tenellum*. *Post-mortem* examination reveals the blind pouches, or cæca, remarkably distended and packed with a yellowish-white cheesy material, which sometimes exudes into the abdominal cavity through perforations in the cæcal wall. Examination of this necrotic material shows these same permanent cysts, and in the scrapings from the inner wall of the cæcum, placed under the microscope, are to be found epithelial cells markedly distended by the invasion and development within them of this parasite. This invasion of the cell results in its final destruction and separation from the wall of which it forms the lining; it then becomes a constituent element of the pasty catarrhal exudate which characterizes the fæces in this affection. In many cases the lungs show the same necrotic change, in some instances the entire lung being transformed into a solid, yellowish-white, cheesy mass. This appears to be the so-called brooder pneumonia.

C. tenellum is frequently found in the intestines (especially the cæca) of chickens of all ages. Thus the droppings contain the permanent cysts which require only warmth and moisture for their development into sporozoites by which the disease is transmitted to other birds.

When received by chickens into their digestive tract in food or grit soiled with infected droppings, the cyst wall bursts or is dissolved and the sporozoites are set free. These penetrate into the epithelial cells, where they grow to great size as schizonts, thus causing the destruction of the cell.

Treatment.

Treatment of coccidiosis in chicks is almost futile. An attempt might be made by the use of calomel, $\frac{1}{10}$ grain, or a few drops of castor oil containing 1 to 3 drops of turpentine. Along with this, 5 to 10 grains of sulphate of iron (copperas) should be dissolved daily in 1 gallon of drinking water.

Prevention.

The essential work in battling with this disease consists in prevention. This must begin with the eggs used for hatching. These should be thoroughly and antiseptically cleansed by wiping in 95 per cent. alcohol. If artificial incubation is used (and in this method lies the great hope of success), the incubator, if used before, should, previous to receiving the eggs, be carefully washed with antiseptic solutions and exposed to the sun. The egg tray should be scalded or flamed. The floor of the nursery should be movable, so that it may be taken out and sterilized, and if made of burlap the old piece should be torn off and a new piece mounted on the sterilized frame. The same precautions should be used with the brooders. The soil to which the chicks have access should be well covered with lime, dug up, and exposed to the drying effects of sun and air. With all the foregoing precautions, absolute freedom from the disease cannot be guaranteed without further experimentation. At least one German investigator has found the coccidia in the white of the egg and in the shell, which had gathered them up in the passage of the egg through the cloaca.

If natural incubation is practised, the hen, for a week or two before being set should be treated with $\frac{1}{4}$ to $\frac{1}{2}$ grain doses of sulphate of iron daily, with occasionally an active purgative, such as calomel 1 grain, or castor oil one half teaspoonful containing 5 to 10 drops of turpentine. The eggs, cleansed as directed above, should be placed in a perfectly fresh nest, which may be sprinkled from time to time with a little lime. After hatching, the hen with her chicks should be placed upon ground that has been thoroughly sterilized, as described above, and at least every few days moved to fresh ground which has been treated in the same way and from which all chickens have been debarred.

The foregoing brief notice of this great drawback to chicken-raising well denominated by Eckhardt "coccidiosis intestinalis internationalis," must now be followed with a brief survey of the same affection as it occurs in other classes of poultry and in other species of birds.

Intestinal Coccidiosis of Adult Chickens.

This disease has been diagnosed by the writer in several flocks. It is characterized clinically by dulness, sleepiness, weakness, diarrhœa, emaciation in spite of a frequently good appetite and a plentiful supply of good food, finally exhaustion and death. Bacteriologic investigation is either negative or results in the cultivation from heart blood

and viscera of such intestinal inhabitants as *Bacterium aerogenes*, *B. sanguinarium*, *Bacillus pyosceaneus*, *B. coli*, *B. proteus*; cases with apparently identical lesions giving different organisms. Failure to examine the intestinal or cæcal contents microscopically results in a false diagnosis. The cases bacteriologically negative are diagnosed—and reasonably so—by the intestinal catarrh and often thickened intestinal walls as chronic indigestion. A change of food is ordered and the disease persists, or, perhaps, sometimes improves temporarily. The false impression thus produced obtains until a relapse occurs, other birds sicken, worms are suspected, and microscopic examination of the fæces of sick birds or of the intestinal contents of dead birds reveals the cause in the presence in large numbers of *C. tenellum*. Administration of a brisk purgative, followed by 10 grains of sulphate of iron (copperas) to the gallon of drinking water, together with thorough disinfection of all runs, results in marked improvement.

During the progress of the above chronic form there will frequently occur exacerbations of the disease in the form of sudden deaths simulating the fulminant form of chicken cholera. In these cases there will be no emaciation and often no preliminary symptoms. The poultryman tells you that his birds went to roost apparently in perfect health, and in the morning he found three, five, or a dozen on the ground dead. Microscopical examination of the cæcal contents reveals the permanent cysts, and histologic sections of the walls reveal the infected epithelial cells; sometimes these may be detected in the smears from the intestinal contents.

In connection with this subject the writer wishes to state that every case of "limberneck," and every case of "leg weakness," and many of the cases popularly denominated "going light" that have come to hand for autopsy in this laboratory during the past fifteen months have shown the existence of a strong invasion of *C. tenellum*.

Intestinal Coccidiosis of Ducks.

This has been demonstrated in all cases of so-called "leg weakness" in ducklings. "Weak germs," "inbreeding," "too early mating of young stock," &c., our too common refuge when confronted with otherwise unaccountable fatalities among young stock, may play their part in furnishing weak constitutions, but the immediate cause in a large number of these fatalities will be quickly recognized as coccidiosis upon microscopical examination.

Intestinal Coccidiosis of Turkeys.

Affecting mostly the young poults, it is, like the same affection in chicks, largely a disease of the cæca, or blind gut. Quite frequently, too, the liver is much enlarged and studded with necrotic areas. The cæca are sometimes enormously distended with a yellowish, pasty, necrotic material. Popularly, but unfortunately, known as "blackhead," it was first studied by Theobald Smith, at that time chief of the Division of Pathology in the Bureau of Animal Industry. Smith named it "infectious entero-hepatitis," and ascribed its origin to a protozoan parasite discovered by him, and which he named *Amæba meleagridis*. Lucet, in 1896, studied the same disease, calling it infectious perityphlo-hepatitis, in view of the intestinal lesions being limited to the cæca. He found the body described by Smith, but was

inclined to consider it a degenerated tissue structure. However, Lucet furnished no clue to another cause.

Since finding *C. tenellum* constantly present in smears and scrapings from cæcal contents of diseased turkeys, and also in the histologic preparations preserved in this laboratory, the writer has hunted through the literature, and finds that Doflein and von Prowazek (1903), Neumann-Macqueen (1905), and Kaestner (1906), had called in question the specific nature of *A. meleagridis* Smith, and had expressed the opinion that the disease is a coccidiosis. Work is in progress in this laboratory, with the object of showing whether the immense mass of necrotic material involved in this disease is the result of the coccidium alone, or depends upon the presence of another associated necrosis-producing organism.

Treatment of this disease has been successful by the administration of half-grain doses of sulphate of iron in pill form every morning, and 2 to 3 grain doses of salicylate of soda every evening, to poults that had been exposed to the disease, or that had shown the dulness, weakness, and watery fæcal discharges so characteristic of the onset of the disease. This treatment was practiced in the midst of infected flocks. It has several times been observed by poultrymen and experimentally demonstrated by Curtice, that attempts to raise poults on ground used by chickens, results in the development of "blackhead" among the young turkeys.

Intestinal coccidiosis of peafowl has been in several instances demonstrated in this laboratory to be identical with the above.

Intestinal Coccidiosis of Pigeons.

This disease has proven itself in the writer's experience a veritable pigeon plague in and around Washington, D. C. The disease exhibits the same clinical phenomena as that of chickens. It may with murderous effect wipe out a large loft in a short space of a few days, or it may worry the owner by steady, unaccountable losses. It may exercise an almost absolute veto power on squab raising. There have been received at this office during the past year what may be termed chronic, acute, and peracute cases. The chronic form, as in chickens, is to all appearances a case of intestinal catarrh or dyspepsia. The acute cases, succeeding one another rapidly, give the impression of an active epizootic of bacterial origin. The peracute, as stated above, simulate in a most striking manner the fulminating cases of hæmorrhagic septicæmia or pigeon cholera.

At post-mortem examination we find subcutaneous hæmorrhages often quite masked in the cervical region, all organs congested and the intestines distended with either gas or catarrhal exudate. The writer has never seen any intestinal necrosis similar to that which obtains in the ceca of turkeys and chicks affected with this disease. The difficulty attending squab raising in the presence of this plague was well illustrated recently. The owner of several lofts brought in some squabs from an infected loft, and stated that the record for this lot of squabs was eighteen raised against twenty-six dead.

Intestinal coccidiosis has also been diagnosed in this laboratory in wild ducks, swans, pheasants, quail, finches, and canaries. In all these the clinical phenomena were those of marasmus, exhaustion, and death.

Although the name *C. tenellum* has been used throughout this article, it must be understood that its use has been only tentative and without prejudice to any other name that priority may justify or to any other variety that may be recognized in the course of the investigations now in progress. This name has been generally viewed as including all the forms found in the intestinal disease in birds.

White diarrhœa of chicks, although forcing itself upon the breeder's attention as a definite disease, should really be regarded by the farmer and poultryman as but one manifestation of a positive poultry pest. It is the evidence exhibited among the weakest of the flock that coccidiosis has invaded the farm; that the causative agent *C. tenellum* has located itself in the intestines of the adult fowls. He must remember that it lodges on the eggs that leave the cloaca of infected hens; that it infects the droppings; that the roosts, the nests, the floors of the houses and scratching pens, contaminated by these droppings, are all sources of further invasion; that the soil of the runs or even of the farm where the fowls range at liberty is another and subtle source of invasion, holding moisture and warmth of sun for the development of the invading sporozoites within the permanent cysts; that the incubators harbour the parasite, the egg tray being infected by the soiled eggs, and the nurseries by the droppings of the infected chicks; that he can no longer hope to be successful in raising turkeys; that if he lets loose his pigeons his chances for squab raising are diminished; that "leg weakness" will sweep away his ducklings; that the intestines thus denuded of their epithelium have become an easy port of entry for the bacterial agents of virulent infections; and, finally, that in spite of the best rules for egg production most scrupulously carried out the almost complete suppression of absorption activities will diminish his egg yield to a minimum. And when he realizes that this organism has to be grown in the laboratory in solutions so strongly antiseptic as to kill all bacteria, the poultryman is forced to appreciate that it is no mean foe with which he has to battle.

(*Bureau of Animal Industry; Circular* 128.)

Clinical Articles.

TWO CASES OF SCROTAL HERNIA IN THE DOG.

BY FREDERICK HOBDAY, F.R.C.V.S., KENSINGTON, W.

Case I.—Reduction without Castration.

The subject was a fox terrier, aged about 2 years, whose left scrotal sac contained a hernia which, when at its largest, was of the size of a large walnut. The hernia did not cause the dog any great inconvenience, but an operation for its reduction was desirable as the dog was of a good strain, and the owner wished to use him at stud. For this it was decided to attempt a cure without castration. The patient accordingly was placed under morphia (1 grain being administered hypodermically) and the operation area prepared in the usual way. The swelling was reduced and an incision was made in the skin over the external abdominal ring, about 1 in. long, and in a direction forwards and inwards. By this means the external opening of the inguinal canal was exposed and the finger was passed into the canal to push the bowel and omentum into the abdomen, the internal ring being thus exposed. This ring was sutured with fine silk, a curved needle being used for the purpose. Several important points are to be observed regarding these sutures, namely, they must be close together (about $\frac{1}{8}$ in.), and great care must be taken that no space is left at either end of the ring, for it is at this point, more frequently than at any other, that failure occurs owing to a return of the bowel. The same applies to all hernia rings, and particular care should be taken that the sutures are carried well up to the ends.

The skin wound was sutured with silkworm gut and covered with iodoform colloid. The operation was entirely successful, and up to the present time, a year after, there has been no return of the trouble.

Case II.—The Radical Operation (also Gersuny's Wax Method) and Unilateral Castration.

The subject was a Pekinese, which was noticed by the breeder to have a right scrotal hernia at 2 months old ; it was advised that the dog should be operated upon when about 8 or 9 months old. When the animal had reached this age the owner brought him up to have the operation performed. The method described in the previous case was adopted, the patient being put under the influence of 1 grain of morphia. Healing was not so rapid as in the former case, and several suture abscesses occurred during the subsequent three months, with the consequence that these sutures had to be removed from time to time. It was a month before it was deemed advisable to send the dog home, and it was returned a few days later with slight suppuration from the wound, and two more of the deep sutures were discovered and removed. Diarrhœa came on at this time and lasted for about a week, but although it occasioned some amount of straining no harm was done apparently until one day when he was heard to cough several times, and later he appeared very dull and would not move. He was picked up and examined, and it was found that in the scrotum, on the same side as the hernia had been, was a swelling of an entirely different

nature; it was very dark in colour, tense, painful to the touch. However, after two hours fomentation with hot water, the swelling subsided, but it was apparent that a small piece of bowel or omentum had found its way into the canal again, and the suddenly occurring painful swelling was no doubt due to strangulation of this portion brought on by the coughing.

In order to obviate the necessity of opening the wound again, Gersuny's operation was tried, 1 drachm of sterilized wax being injected over the external ring under the skin, but this failed entirely to give the desired result and it became necessary to remove the right testicle by the covered operation, the ligature including the tunica vaginalis. The scrotal wound healed by first intention, but again the original wound opened and another deep suture had to be removed. The cause of this trouble was probably that the silk used was thicker than is usually employed for this purpose, the movement of the leg setting up a considerable amount of irritation. After the last operation matters progressed very favourably, and both wounds are now merely slight scars.

ENTEROTOMY—REMOVAL OF FOREIGN BODY FROM THE BOWEL. RECOVERY.

BY ALEXANDER JOHNSON, M.R.C.V.S., TWICKENHAM, AND FREDERICK HOBDAY, F.R.C.V.S., KENSINGTON, W.

THE subject was a Japanese spaniel bitch, aged 2½, and weighing about 6 lb., who was thought to have eaten a pine cone.

The history was that she had had no action of her bowels for four days, although she had been given castor oil and enemas and she now showed signs of abdominal pain and was depressed and dull. Vomition had taken place several times, and by abdominal palpation a foreign body could distinctly be felt in the bowel. It was decided to perform an exploratory laparotomy, and if necessary open the bowel also. The little dog was given 1 grain of morphia injected under the skin, and in half an hour she was placed on the operating table, having been shaved over the abdomen and scrubbed with ether soap, and further washed with a solution of chinosol (1 grain to the ounce). An incision was made about the middle of the abdomen on the median line, and the bowels were manipulated to find the obstruction. This was soon discovered, about 12 in. behind the stomach, and the bowel at this point was pulled gently outside the skin wound. It was seen to be rather inflamed for an inch or so. An incision was made on the foreign body, which was found to be a smooth pebble about 1 in. long and ½ in. thick. The bowel was well cleansed with the antiseptic, both internally and externally, and the wound was closed by means of a double row of Lembert's sutures of fine silk, none of which pierced the lumen of the bowel. The bowel was again cleansed with chinosol solution and returned. The abdominal wall was sutured closely with silk and the skin wound with silkworm gut, the sutures being placed one sixth of an inch apart and painted over with iodoform colloid. Neither chloroform nor cocaine was used, the patient remaining per-

fectly quiet throughout under the influence of the morphia, and without showing the slightest evidence of pain.

As regards after-treatment, the bitch was placed on clean blankets with a hot water bottle and was not interfered with in any way for twelve hours, when she was given 5 drops of bovinine in a little iced water; this was repeated every two hours, and during the following day she showed signs of returning appetite and strength. She continued to improve and some of the stitches were removed in five days and a body bandage applied. This bandage was left off after the eighth day and the wound healed and the bitch was sent home on the twelfth day. The period of convalescence was marked by no relapse and the appetite continued good throughout after the second day.

DEATH FROM OBSTRUCTION OF THE BOWELS BY A PEBBLE.

BY D. CHATTERLEY, M.R.C.V.S., ROYAL VETERINARY COLLEGE, LONDON.

Subject.—Fox-terrier, male, aged, about 15 lb.

History.—The dog was brought into hospital suffering from otorrhœa on May 18, and was accordingly put under treatment, which lasted about five weeks. First, boracic acid 10 grains to ʒ i., with spirit 1-8 for a fortnight. Effects only moderate, the case proving very obstinate. Changed to lotio plumbi (liq. plumbi and aqua pts. æq.) Improved, and in three weeks later was about to be discharged cured when he commenced to vomit. June 24, vomit consisted of ordinary food material. He refused solid food, but drank water. Bismuth subnit. and salol āā grains v. were then prescribed four times daily, followed by bovril, which was retained. Temperature normal.

On the 25th, in the early morning, he was found collapsed, almost unconscious, extremities cold. Temperature subnormal, 96·8° F., and vomiting occasionally. Stimulants were administered in the form of spts. vini gallici (brandy) ʒ i. to milk ʒ ii., alternated hourly with bovril. Hot water cloths were applied to the abdomen. Chinosol grains iii. was added to the powders. Tinc. nucis vom. ♏iii. and sp. ammon. arom. ♏xx. in aq. ʒii., three times daily, administered after the powder. Under this treatment he improved slightly, and his temperature went up to 100° F.

On the 26th he appeared brighter, and the vomiting had ceased. He was, however, still weak, and was somewhat rigid, and jumped when startled. The nux vomica was discontinued, and the other treatment was persevered with. He got stronger, and even ran out a few yards. At 6 p.m. his condition appeared quite satisfactory, but on visiting him at 8 o'clock he was found dead.

Post-mortem Examination.—The stomach was normal, and its mucous membrane was coated with bismuth. The only lesions found were in the large bowel, which was intensely discoloured, and contained a large pebble, 1 oz. in weight, with a long diameter of $1\frac{5}{8}$ in., and short diameter of $1\frac{1}{8}$ in. This I believe to have been the cause of death.

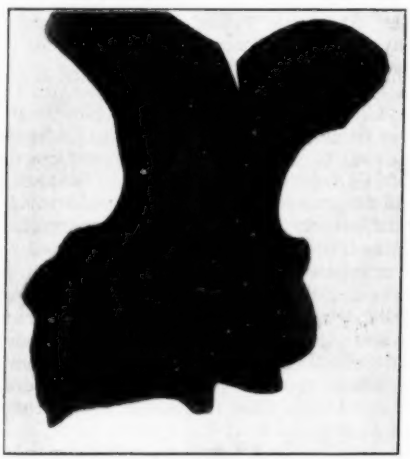
The interesting point of the case lies particularly in the fact that

the dog must have had the pebble inside for over five or six weeks without causing any symptoms, since he had access to none after being brought in. Probably it had remained in the stomach until just before the vomiting occurred, and had then passed into the bowel, causing the above symptoms.

FRACTURED PELVIS CAUSING DYSTOKIA.

BY C. W. TOWNSEND, M.R.C.V.S., LONG STANTON.

THE subject was a 5 year old bay shire mare which I was called to one night, because she could not deliver her foal. Examination revealed the presentation to be a normal one, but that the abnormally small size of the pelvic cavity made delivery practically impossible. I therefore had the animal destroyed. *Post-mortem* examination revealed that the cause of this dystokia and malformation of the pelvic cavity was the result of an old standing fracture. I



Fractured pelvis with callus.

know it was of old standing, partly because of the extensive callus present (as shown in the photo) and also because this animal had been in its present owner's possession for nearly three years, during which time it had always shown an uneven gait when trotting, although walking sound. The callus involved principally the pubic bones and the region around the cotyloid cavity, but luckily only slightly affected the articular surface of the latter, which probably accounted for the slight lameness. From the photo one can see that the ischial bones at the arch have become separated to a

considerable degree, but from the large amount of callus produced at the pubic symphysis and the fact that there was scarcely any at the ischial symphysis, I am inclined to think that the separation here was produced either at the time of parturition or else during the subsequent boiling process of the bones.

Remarks.—The case appears interesting to me, first because, although we often meet with pelvic fractures, yet we seldom find animals recover sufficiently to do any work afterwards. Secondly, it serves to illustrate the danger which one runs in breeding from an animal which has had a fractured pelvis, for the diminution from the normal size of the pelvic cavity produced in this case was remarkable, it being reduced by nearly one-half of its normal width.

A CASE OF FRACTURED JAW IN A HORSE.

BY MESSRS. HODGKINS AND SON, M.R.C.V.S., HANLEY.

Subject.—A bay cart mare, aged 7.

History.—The mare broke loose in the stable during the night, was kicked in the mouth, and had the jaw fractured in two places, the near side and centre, two teeth being knocked out.

Treatment.—We cast her, after fasting her for twenty-four hours, and administered chloroform. We then drilled holes on each side of the fracture and pulled the pieces of bone into position with silver wire. As soon as she got up she was immediately able to eat. After a month's rest, she has now gone to work, the wire being left *in situ*. The union seems quite firm and strong, and each callus can be felt quite distinctly.

AN INTERESTING FRACTURE, FOLLOWING A PREVIOUS ONE.

BY CLEMENT ELPHICK, M.R.C.V.S., NEWCASTLE-ON-TYNE.

Subject.—A bay van gelding, aged 13, in fair condition.

History.—Brought in from work at the breakfast hour on May 30. After asking the driver to tell me of any facts upon which I could form a basis for diagnosis, his story revealed the following: During the past fortnight the horse—which is a bad worker—had fallen down three or four times whilst in the yoke, and at no time was there any discernible cause for the mishap; after lying a little while he would rise of his own accord, and without difficulty. During the past two or three days the horse began walking in a peculiar way, and it was this that had finally attracted the driver's attention to the fact that there was "something wrong."

I had the horse walked straight, the body swaying from side to side, marked platting of the fore and hind legs, and every few yards a dropping of the hindquarters; the movements were finished in an involuntary way, rather like locomotor ataxia.

Turning from right to left, and *vice versâ*, platting very pronounced, especially behind, the horse at times nearly overbalancing. Backing was only performed with difficulty, none of the feet being lifted, and great depression of the hindquarters. Yielded to pressure immediately in front of and behind the superior iliac spines.

Diagnosis.—Serious spinal trouble in the lumbar region.

Treatment.—Removed all the shoes, put him in a roomy loose-box bedded thinly with old moss-litter. Had him prepared for physic, and gave him a 6-drachm dose of aloes the next morning. Physic acted well, and I kept the horse on a laxative diet. Clipped the back, from the loins to the root of the tail, and personally applied a good strong "charge" over the clipped portion. This was done on June 2, and I awaited results.

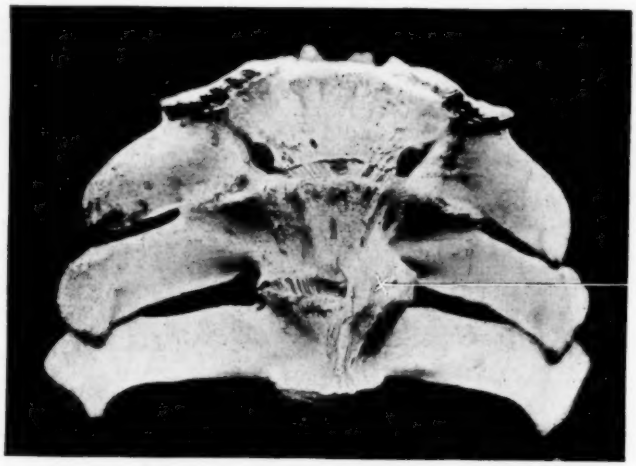


FIG. 1.—The old fracture of 1903.

In the meantime I found out from Glasgow, whence the horse originally came, that "five years ago the horse had a similar affection, and had been examined by an eminent veterinary surgeon there, and he had advised getting rid of the animal. He offered the opinion that the horse would never be capable of doing *strenuous* work again. The veterinary surgeon employed by the firm gave the horse a chance, and charged the back and turned him out over the winter. He came back sound and in good condition, and did light work for some considerable time in Glasgow. He was then transferred to Newcastle-on-Tyne, twelve months ago, but during the whole time he has been a bad worker, and has not earned his corn."

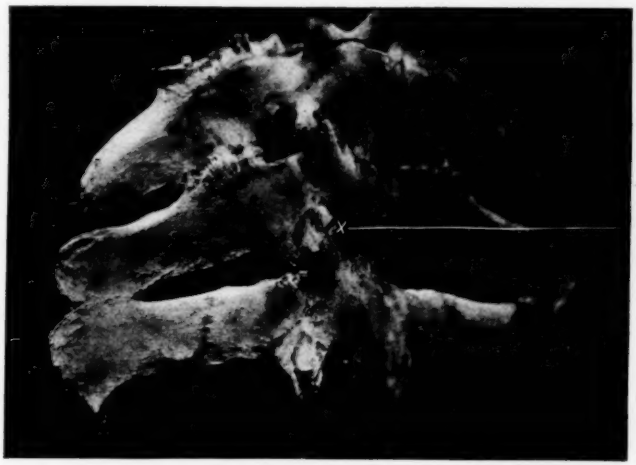
June 20.—Visited and saw the horse; feeding well; moving freely about the box; lying at night-time on both sides, and getting up without difficulty; no improvement whatever in the walk.

June 27.—Had the horse out of the box. Movements decidedly

worse, especially the hindquarters. Ordered the charge to be removed, and the back well brushed three times a day with a strong "dandy." Commenced giving biniodide of mercury in 10-grain doses night and morning. This treatment continued for a fortnight.

July 14.—Movements worse, off foreleg being lifted as in stringhalt. Advised destruction, which was carried out on the 18th.

Post mortem.—All the organs healthy. Found a large callus situated upon the body of the second lumbar vertebra, and on the off side. This is the 1903 fracture. After boiling and cleaning, another callus was revealed; it was much smaller, but showed recent formation. This is the 1908 fracture. There is a *slight* protrusion into the lumen of the canal from this latest callus, and this would account for the movements of the animal becoming gradually worse. I showed the speci-



The callus.

FIG. 2.—The later fracture of 1908.

men to a doctor friend of mine. He calls the condition a "fracture of a fracture," but I hardly see it. Slings in this case would have been more than useless.

The photographs show the state of affairs very well.

NOTES ON SOME CASES OF PURULENT METRITIS.

BY FREDK. HOBDAY, F.R.C.V.S., AND EDGAR BELCHER, M.R.C.V.S., KENSINGTON, W.

Apropos of the enlightened correspondence which is taking place in a contemporary on the subject of metritis in the bitch, it may not be without interest to quote the following typical cases of this commonly-occurring condition :—

Case 1.—The subject was a well-bred bull bitch, aged 3, and had never had puppies. She had been lined by accident when in œstrum, and was due to whelp on February 3 of this year. There was slight abdominal enlargement, but the owner was doubtful as to whether she was in whelp or not. When she was due to have the puppies, instead of these there came away a considerable amount of odourless, coffee-coloured, thick discharge. The treatment in hospital consisted in the washing out of the uterus three times a day with a warm solution of chinosol (1 grain to the ounce of water). There was little or no systemic disturbance. The discharge ceased in a week or so, and she was sent home, only to be returned in a fortnight on account of a relapse of the trouble. As the bitch was a pet, and not used for breeding, the owner was advised that hysterectomy was the only radical cure, and should be performed. This was agreed to, and the operation was carried out with all aseptic precautions, the uterus having first been washed out with a strong antiseptic solution, so as to avoid contamination of peritoneum with the infected stump. The operation was successful, and the wound healed in a fortnight, and, with the exception of a skin suture abscess, which gave some little trouble later, everything went on very well. The uterus, when removed, was seen to have very much thickened walls, and was very congested. About the middle of June it was noticed by the owner that there was a small quantity of yellowish-white, thick discharge from the vulva, and the bitch was again put under treatment, being syringed with zinc sulphate (5 grains to the ounce). This apparently had little effect on the amount of the discharge. The next procedure was to thoroughly curette the vaginal mucous membrane, the bitch being under the influence of morphia, and then follow by an injection, twice daily, of liquor plumbi subacetatis with an equal quantity of water. This undoubtedly is producing the desired result, and at the time of writing, July 11, the discharge is gradually decreasing in quantity.

Case 2.—*Subject.*—A black-and-tan terrier bitch, aged 4. Had had two litters of puppies, but not any during the last year. Advice was sought because of a progressive enlargement of the abdomen, and a discharge from the vulva, sometimes in large quantity, and of a dirty yellow-coloured pus. The owner thought she was dropsical, and on being told of the real nature of the disease decided to have her painlessly destroyed.

It is not unusual for the uninitiated to mistake this disease for ascites, but the differences are fairly well marked. The abdomen lacks the pendulous appearance so characteristic of ascites, the distension being most marked in the position of the uterine horns; that is to say, along each side of the abdomen in a horizontal position. On palpation, the hugely distended horns of the uterus may be distinctly felt as sausage-like bodies. The absence of the "razor-back" is also a point of distinction. These points, taken in conjunction with the sex of the animal, are sufficient evidence on which to base diagnosis, and the presence of discharge is ample proof.

An examination of the body of this bitch showed that the uterus was enormously distended; each horn (which normally would be less in diameter than an ordinary pencil) was 1½ in. in thickness. The walls were much thickened, and the contents consisted of pus of a dirty white or yellow colour. The ovaries were cirrhotic, and

resembled a bunch of grapes. Besides all this there were large old-standing lesions on both auriculo-ventricular valves, and the liver weighed 1 lb. 10 oz., or about twice the normal weight in a dog of that size, and was very pale and friable.

CASE 3.—The subject was a Yorkshire terrier, weighing 6 lb., aged 4, brought to hospital with a slight, dark yellow discharge from the vulva and distension of the abdomen. Hysterectomy was advised as the only radical cure, and was carried out in the usual way, the uterus first being syringed out. The operation went off without a hitch, and the horns of the uterus were both about 1 in. in diameter, and distended with dirty, rust-coloured pus. The walls were thickened. The ovaries were normal. The bitch died two days later, probably from surgical shock. Unluckily, the owner would not permit a *post-mortem* examination.

CASE 4.—The subject was a Blenheim spaniel, aged 9, weighing normally about 12 lb. She had been for months gowing larger in the abdomen, and when advice was sought she was vomiting frequently, extremely prostrated, and was thought by the owner to be dropsical. There was slight vaginal discharge. Obviously collapsing, she was put to death with chloroform, and upon *post-mortem* examination it was found that the uterus occupied at least nine-tenths of the abdominal space, each horn being 3 in. in diameter. The walls were not much thickened, but were distended almost to bursting point with pus.

These cases demonstrate the fact that it is by no means old bitches alone that are the subjects of chronic metritis, though it certainly occurs more frequently in old than in young. Dilatation of the *os uteri* and antiseptic washes will give good results in a few cases during the earlier attacks, but the only radical cure is ovaro-hysterectomy. The disease rarely occurs in bitches which are regularly allowed to breed, and is seen most commonly in those who have failed to take the dog several times, or who have never had a litter of puppies.

A CLOACAL FORMATION IN A BITCH.

BY H. BRASSEY-EDWARDS, M.R.C.V.S., ROYAL VETERINARY COLLEGE, LONDON.

THE subject was a brindle bull bitch, aged 10 days, brought to the clinique. No history was forthcoming. The owner had only possessed the animal one day, and he remarked the dog showed inability to pass its motions, but nevertheless had taken a moderate amount of milk. On examining the dog, the bowels were found to be full, but not distended, with soft fæces, and there was no anus. Manipulation in the perineal region found that the prominence usually felt in imperforate anus was missing—this prominence is the end of the blind rectum. With the consent of the owner, an anæsthetic was administered by the application of cotton wool, moistened with an ½ oz. of A.C.E. mixture, to the nostrils. A probe passed into the vulva acted as a guide and a prevention from wounding the external coat of the vaginal passage.

A short incision was made over the perineal region above the vulva, the skin reflected, and a large amount of underlying adipose tissue removed.

On subsequent dissection no trace of the gut was found, and after a thorough search of the pelvic cavity, without success, laparotomy was decided upon. The umbilical region of the abdominal wall had been prepared in the usual manner, and an incision 2 in. long made through the skin on the median line when the dog succumbed to the anæsthetic. This I attributed to the youthfulness of the animal, its weakened condition, and the long anæsthetic period—1¼ hours.

On *post-mortem* examination the rectum was found to have an opening into the neck of the uterus, and evidently the dog had been passing fæces and urine through a common orifice.

The opening into the *cervix uteri* would permit the passage of a medium-sized probe, while the other parts of the female organs were normal.

This is a case which shows how important the history is when one makes a diagnosis. It is highly probable the dog might have lived with this cloacal formation with the aid of laxatives and special dieting.

Abstracts and Reports.

THE PRODUCTION AND HANDLING OF MILK—"A DAIRY FARM CONTEST."

In view of the recent discussion on the above subject at the Central Veterinary Medical Society, London, the following account of a "Dairy Farm Contest" will probably be of interest. The directions for scoring would serve as a very useful basis for similar contests, which might with advantage be established in the British Isles. The account is extracted from a paper by C. B. Lane and J. C. Weld, as embodied in Circular 117 of the Bureau of Animal Industry, United States Department of Agriculture. The contest was carried out under the direction of the Bureau of Animal Industry and the Chamber of Commerce of Cleveland, at the latter city.

The Dairy Farm Contest.

This was an entirely new feature in connection with milk contests, and proved to be of great interest and practical value. Twenty-five dairymen entered their farms in this contest, and the farms were visited by the judges, and scored on the basis of the score card shown below. While this part of the work required considerable time and some expense, it is believed that it resulted in much good along the line of improving the conditions affecting the city milk supply. Full details of this feature of the work are given in the table.

[United States Department of Agriculture, Bureau of Animal Industry, Dairy Division.]

SANITARY INSPECTION OF DAIRIES.

Owner or lessee of farm .
Town . State .
Total No. of cows . No. milking . Quarts of milk produced daily .
Is product sold wholesale or retail?
If shipped to dealer, give name and address .
Permit No. . Date of inspection , 1907.

	Score		Remarks
	Perfect	Allowed	
Cows.			
Condition	2		
Health	8		
Cleanliness	5		
Water supply	5		
	20		
Stables.			
Construction	5		
Cleanliness	5		
Light	5		
Ventilation	4		
Cubic space per cow	3		
Removal of manure	2		
Stable yard	1		
	25		
Milk-house.			
Construction	2		
Equipment	3		
Cleanliness	5		
Care and cleanliness of utensils	5		
Water supply (temp. ° F.) ...	5		
	20		
Milkers and Milking			
Health of Attendants	5		
Cleanliness of milking	10		
	15		
Handling the Milk.			
Prompt and efficient cooling ...	10		
Storing at a low temperature ...	5		
Protection during transportation	5		
Temperature of milk ° F.			
	20		
Total score	100		

Sanitary conditions are: Excellent . Good . Fair . Poor .
Suggestions by Inspector .

(Signed) , *Inspector.*

Directions for Scoring.

Cows.

Perfect score.

Condition and healthfulness.—Deduct 2 points if in poor flesh, and 8 points if not tuberculin-tested 10

Cleanliness.—Clean, 5; good, 4; fair, 2; bad, 0 5

Water supply.—If clean and unpolluted, 5; fair, 3; otherwise, 0 5

Stables.

Construction.—For cement floor or other material equally as good (*a*)* in good condition allow 2 points; fair, 1; poor, 0; wood floor (*b*) or other material in good condition, 1; fair, ½; poor, 0; good tie (*c*), 1; good manger (*d*). 1; box stall (*e*), 1 5

Cleanliness.—If thoroughly clean, including floor (*a*), windows (*b*), and ceilings (*c*), 5; good, 4; medium, 3; fair, 2; poor, 1; bad, 0 5

Light.—Four square feet of glass per cow, 5; 1 point off for each 20 per cent. less than 4 square feet 5

Ventilation.—Good ventilating system, 4; fair, 3; poor, 2; bad, 0 ... 4

Cubic space per cow.—If 500 cubic feet or over per cow, 3; less than 500 and over 400, 2; less than 400 and over 300, 1; less than 300, 0 3

Removal of manure.—Hauled to field daily, 2; removed at least 30 feet from stable, 1; otherwise, 0. 2

Stable yard.—In good condition (*a*), ½; well drained (*b*), ½; otherwise, 0 ... 1

Milk-house.

Construction.—Tight, sound floor, and not connected with any other building (*a*), well lighted (*b*), well ventilated (*c*), 2; (*d*) if connected with another building under good conditions, 1; otherwise, 0; (*e*) if no milk-house, 0 2

Equipment.—Hot water for cleaning utensils (*a*), 1; cooler (*b*), 1; proper pails (*c*) and strainers (*d*) used for no other purposes, 1 3

Cleanliness.—Interior clean, 5; good condition, 4; medium, 3; fair, 2; poor, 1; bad, 0 5

Care and cleanliness of utensils.—Clean (*a*), 3; kept in milk-house or suitable outside rack (*b*), 2; otherwise, 0 5

Water supply.—If pure and clean running water, 5; pure and clean still water, 3; otherwise, 0 5

Milking.

Attendants.—Healthy 5

Cleanliness of milking.—Clean milking suits, milking with clean dry hands, and attention to cleanliness of udder and teats while milking, 10; no special suits, but otherwise clean (*a*), 7; deduct 4 points for unclean teats (*b*) and udder (*c*), and three points for unclean hands (*d*). 10

Handling the Milk.

Prompt and efficient cooling.—If prompt (*a*), 5; efficient (*b*), if 50° F. or under, 5; over 50° and not over 55°, 4; over 55° and not over 60°, 3; if neither prompt nor efficient, 0 10

Storing at low temperature.—If 50° F. or under, 5; over 50° and not over 55°, 4; over 55° and not over 60°, 3; over 60°, 0 5

Protection during transportation to market.—If thoroughly protected (iced), 5; good protection, 4; partly protected, 2; otherwise, 0 5

Score. 100

If total score is 90 or above and each division 85 per cent. perfect or over, the dairy is Excellent (entitled to registry).

If total score is 80 or above and each division 75 per cent. perfect or over, the dairy is Good.

If total score is 70 or above and each division 65 per cent. perfect or over, the dairy is Fair.

If total score is below 70 and any division is below 65 per cent. perfect, the dairy is Poor.

* The letters *a*, *b*, *c*, &c., should be entered on score card to show condition of dairy, and when so entered should always indicate a deficiency.

DETAILED SCORES OF THE TWENTY-FIVE DAIRY FARMS ENTERED IN THE DAIRY-FARM CONTEST.

Farm No.	Cows (perfect 20 points)	Stables (perfect 25 points)	Milk-house (perfect 20 points)	Milking (perfect 15 points)	Handling of milk (perfect 20 points)	Total score (perfect 100 points)
1...	10·0	14·0	2·0	10·0	5·0	41·0
2...	11·0	14·0	7·0	10·0	0·0	42·0
3...	4·0	14·0	8·0	10·0	10·0	46·0
4...	8·0	3·0	12·0	10·0	15·0	48·0
5...	7·0	8·0	16·0	10·0	10·0	51·0
6...	10·0	11·0	7·0	10·0	15·0	53·0
7...	11·0	13·0	13·0	10·0	10·0	57·0
8...	18·0	10·5	10·0	10·0	10·0	58·5
9...	15·0	8·0	10·0	12·0	15·0	60·0
10...	12·0	13·0	11·0	10·0	15·0	61·0
11...	12·0	18·0	7·0	10·0	15·0	62·0
12...	10·0	21·0	8·0	10·0	15·0	64·0
13...	7·0	10·0	17·5	10·0	20·0	64·5
14...	12·0	12·0	11·0	10·0	20·0	65·0
15...	12·0	16·0	7·0	10·0	20·0	65·0
16...	12·0	22·0	12·0	10·0	10·0	66·0
17...	19·5	16·0	7·0	10·0	15·0	67·5
18...	12·0	23·0	11·0	13·0	10·0	69·0
19...	12·0	16·0	16·0	12·0	15·0	71·0
20...	7·0	19·5	18·0	10·0	20·0	74·5
21...	14·0	20·5	16·0	10·0	20·0	80·5
22...	12·0	18·0	17·0	15·0	20·0	82·0
23...	11·5	21·0	19·0	12·0	20·0	83·5
24...	12·0	23·0	15·0	15·0	20.0	85·0
25...	19·5	21·0	17·0	12·0	17.0	86·5
Average	11·6	15·4	11·8	10·8	14·5	64·1
Average per cent. perfect	58·0	61·6	59·0	72·0	72·5	64·1

PRINCIPAL DEFECTS FOUND.

The greatest defects on the dairy farms were found to be the lack of cleanliness of the cows and the non-application of the tuberculin test. This test had been applied to only five of the twenty-five herds, and as it counted 8 points in the score, the low average for the cows is thus explained. The cows in fifteen of the herds were more or less dirty. The water supply was generally good. The average rating for the cows was 11·6 points out of a possible 20.

The next greatest defect was found in the construction, equipment, and cleanliness of the milk-houses. Many farms had no milk-houses or special rooms for handling the milk; some were lacking in the proper equipment—particularly coolers and facilities for heating water. The water supply and utensils for the milk-house were generally good. Seven out of the twenty-five received a perfect score for cleanliness. The average score for all of the milk-houses was 11·8 points out of a possible 20.

The third lowest rating was given to the stables, which scored 15·4 points out of a possible 25. The greatest defect here was the lack of cleanliness, although the light and ventilation were frequently deficient.

The construction, as a rule, received a good rating, and the cubic space per cow was generally satisfactory.

The cleanliness observed in milking was generally good, and the method of handling the milk satisfactory. These two branches of the dairy work rated 72 and 72·5 per cent. respectively.

Application of the Cleveland Plan to other Cities.

The results obtained in the contest described in the preceding pages indicate that a similar meeting and exhibit would be of value in improving the milk supply of any city. It is simply a means of reaching the producer, the dealer, and the consumer, and educating them along the line of clean milk. That the plan worked successfully in Cleveland there is no question, and it is believed that there are scores of other cities where similar results might be obtained. Such a contest should have the direct support of the Board of Health, or some organization directly interested in improving the milk supply.

Cleveland's Experience with the Tuberculin Test.

Cleveland was one of the first cities to incorporate in its ordinances a requirement that no milk should be sold in the city except from dairies holding certificates that their cows are free from tuberculosis as shown by the tuberculin test. The experience of this city is therefore of interest and value in connection with the subject of a wholesome milk supply for cities. Following are the sections of the Cleveland ordinance relating to the tuberculin test:—

Part I., *Title* 5.

> Section 4.—On and after the ——— day of ———, 1906, no milk will be allowed to be sold or offered for sale or brought into the city from any cow or cows unless the owner of said cow or cows holds a certificate of this Board's veterinarian, or other veterinarian acceptable to this Board, that said cow or cows are free from tuberculosis as shown by the tuberculin test.
>
> Section 5.—Any person selling or offering for sale any milk from uninspected cows as above shall be subject to having his licence revoked.

The city did not attempt at the outset to require all dairymen to conform to this section, and it is not the intention to do so until the State laws on the subject are more efficient, and provide prompt compensation for cattle destroyed. At present the tuberculin test is required only of dairies where tuberculosis is known to exist as determined by physical examination, or by tracing cattle killed at abattoirs. If the owner does not consent to the test and to the slaughter of the reacting cattle, his milk is excluded from sale in the city, and in addition the State Board of Live Stock Commissioners is notified, which commissioners have the authority to enforce the test or to quarantine the suspected herd. If the owner consents, the test is made free of charge. After the test the reacting cattle are appraised by two disinterested persons, one selected by the Board of Health, the other by the owner. The average between the two values is taken as the true value, and the appraisal and report of the test are submitted to the State Board of Live Stock Commissioners. If this Board approves the

finding, an order is issued authorizing the Health Department to destroy the reacting cattle, which is done and promptly reported back to the State authorities. The approved appraisal is then submitted to the Governor, approved by him, and submitted to the proper committee of the Legislature, which finally instructs the State auditor to draw a warrant for the claim. The law allows from one-half to three-fifths of the appraised value, but so far all claims have been paid in full.

The attitude of the dairymen toward the test was somewhat hostile at first, which was natural, as it was a great surprise to them to find that tuberculosis existed to such an extent among their herds. Several instances were met, however, even at the first, of exceedingly public-spirited dairymen who did all in their power to assist the Board of Health, even where the losses were very severe. The hostile feeling manifest at first has since given way to a fair-minded conception of the situation, and the only objection to the general application of the test is the long delay in the payment of the claims. This is a very great hardship on a dairyman who is in debt, and dependent upon his cattle for the support of his family, especially as in Ohio the Legislature meets only every alternate year.

The following are the statistics of the work of the Board of Health for the eighteen months beginning with January, 1906:—

Number of herds tested	20
Number of cattle tested	280
Number of reactions	89
Percentage of reactions	32

Tested by other veterinarians under direct supervision of the Board of Health:—

Number of herds tested	13
Number of cattle tested	201
Number of reactions	29
Percentage of reactions	15

It is understood that within the same period about three times as many cows have been tested by private veterinarians, the reacting cattle being secretly sold and shipped to other States.

The greatest good accomplished has been in the dissemination of knowledge concerning bovine tuberculosis among not only the dairymen, but the people generally. The Health Office receives almost daily enquiries as to where milk from tuberculin-tested cows can be had for domestic purposes, and almost as many enquiries as to where tuberculin-tested cows can be purchased. Nearly one-half of the herds tested have been tested as the result of requests of owners who desired to know for themselves what condition their herds were in. This has been specially true in the last six months. It is expected that more cattle will be tested in the next year than in the preceding eighteen months, and if State laws can be passed that will be satisfactory and efficient, and provide a fair compensation, there will probably be more herds to test than the present force can handle.

The efforts of the Cleveland Board of Health to eradicate tuberculosis from dairy herds and to secure a safe milk supply for the city deserve commendation, and other cities may well profit by this experience, and adopt similar measures to safeguard the health of the public.

Importance of the Tuberculin Test.

The public has become aroused, and general interest is being manifested, especially in measures for reducing the mortality from tuberculosis in human beings. This is shown by the formation of societies throughout the country for furthering these measures, and by the general campaign of education which is now under way. It has been shown beyond question that human tuberculosis and animal tuberculosis are communicable between persons and animals, and that a considerable proportion of the cases of human tuberculosis are caused by infection from animal sources. The eradication of tuberculosis from dairy cows is therefore very desirable as a protection to human health.

The tuberculin test is recognized by sanitarians as an agency of the greatest value for detecting tuberculosis in dairy herds and for controlling and eradicating the disease. Without its assistance but a small percentage of the cases could be detected in the live animals. It is remarkably accurate, the records of thousands of cases in which the animals have afterwards been slaughtered showing a correct diagnosis in 97 per cent.

Unfortunately, in the early attempts to control tuberculosis in some States, measures were adopted which were so radical that they aroused the antagonism of the dairymen and cattle-owners generally, and little was accomplished in the way of either benefiting the cattle-owners or removing the dangers of the disease to the public. It is time that those interested in the dairy and live-stock industries of the country should give their support to all measures tending to check this widespread disease and to prevent the serious losses which it causes. It is to their interest to do so purely as a business proposition, regardless of any benefit to the public health.

A practice which is largely instrumental in the spread of tuberculosis is the sale of animals known to be diseased without transmitting this knowledge to the buyer. This is done not only in private sales, but at public auctions as well. This practice should be stopped. Where the tuberculin test is used under the direction of a board of health, the animals, as a rule, are properly marked (usually by placing metal discs in the ears), showing whether they are tuberculous or healthy. This plan is to be commended, as it renders difficult the deception of a purchaser.

While some States have laws prohibiting the importation of cattle without the certificate of a veterinarian showing that they have passed the test, other States have no such laws, and the transfer of animals from one State to another goes on without molestation. This shows the necessity of the Federal Government taking some action in the near future to prevent the inter-State shipment of diseased animals. The work of the Government might also be extended still further in a co-operative way, so that, when the disease is discovered, the information will be communicated both to the owners of the animals and to the proper State authorities.

The Bureau of Animal Industry furnishes tuberculin free of charge to public officials for making tests under certain conditions.

Methods for Eradicating Tuberculosis.

This subject has been discussed at some length by Dr. D. E. Salmon in Bulletin 38 of the Bureau of Animal Industry. Because

of its important bearing on the improvement of the milk supply, the following extract from that publication is appended:—

Eradication of Tuberculosis from the Farm.

If there is any reason to suspect the existence of tuberculosis in a herd, an effort should be made at once to determine definitely whether it is present, and which animals are affected by it.

The general condition of the animal should furnish some indication. If any of the animals are not doing well, are losing flesh, and fail to yield the amount of milk which is to be reasonably expected, a careful examination should be made of them to determine whether their temperature is normal, whether there are signs of enlargement of the external lymphatic glands, and whether abnormal sounds can be detected in the lungs. The examination of the carcases of any animals which may have died or are slaughtered is a valuable indication as to the existence of the disease in the herd.

The most reliable means of determining this question is, however, the tuberculin test. While this may occasionally fail to reveal tuberculosis in an individual animal, it may be relied upon with certainty to reveal the existence of the disease in a herd. If this test indicates that some of the animals are tuberculous, measures should be at once adopted to eradicate the disease from the herd, or at least to prevent its further spread. In case there are only one or two animals affected, and these are not especially valuable, the best plan is to slaughter them at once and thoroughly disinfect the stable in which they have been kept. If a large proportion of a herd is affected, and the animals are not especially valuable, the best and cheapest plan would be to separate the reacting animals from the healthy ones, and to have the former slaughtered under inspection as soon as they can be put in proper condition. It is probable that the flesh of most of these animals would be found fit for food, and the loss, therefore, would not be very great. In case the herd has been long affected and many of the animals are in an advanced stage of the disease, they are unfit for milk production, and the sooner they are slaughtered the less will be the loss.

If the herd contains animals which are valuable for breeding purposes, the Bang system of management or some modification of it may be profitably adopted.

State Aid for the Eradication of Tuberculosis.

In the eradication of a disease so widely disseminated, and one which causes such serious losses to the animal industry of the country, there should be assistance offered by the State in order to relieve the burdens which fall upon the owners of live stock. A considerable number of States have shown a disposition to come to the assistance of farmers whose stock is affected, but the assistance has sometimes been coupled with conditions which made it unwelcome. In some States compulsory testing and the slaughter of reacting animals have been required, but this has not been a popular measure. It is essential that a plan should be devised which will meet with the approval of the stock-owners, and which will aid them without being too burdensome in its conditions. There are certain measures which have been adopted by individual States which have accomplished satisfactory

results, but which would be far more successful if adjoining States would adopt the same or similar regulations. Among the reasonable measures which a State may adopt for the repression of tuberculosis the following may be mentioned:—

(1) Cattle which are brought into a State for breeding or dairy purposes may be tested with tuberculin, and those which react may be refused admission to the State. In connection with this measure, t should be provided that cattle which have been tested by the authorities of another State or of the Federal Government and found free from disease should be allowed admission without being re-tested. The testing of animals coming into a State is essential in any effort to control this disease, and is one of the first measures which should be enforced in any effort to eradicate it.

(2) There should be an inspection of all slaughtered animals coming from breeding or dairy herds within the State in order to discover in what herds the disease exists. Animals from the greater part of the milk-producing herds are being continually sold for slaughter, as their usefulness in the dairy is over, and an examination of the carcases of these cows would serve to locate the existence of the disease in many herds where its presence is unsuspected. Unfortunately, few of the animals killed in the small slaughter-houses are inspected, and in those cases where there is an inspection, and tuberculosis is discovered, it is seldom that the herds from which they came are traced, and the owners informed of the discovery of this disease. In any effort to suppress tuberculosis it is almost essential that information of this kind should be obtained, and an attempt made to persuade the owner to adopt proper measures for getting rid of the contagion.

(3) Measures should be adopted for testing herds with tuberculin without expense to the owners. In the beginning of the work, at least, this should not be compulsory, but it should be made to the interest of the owner of a tuberculous herd to have it tested under the auspices of the State. Apparently it would also be wise and a great aid to stockmen for the State to test herds with tuberculin, and certify to the healthfulness of animals from all those herds where no reactions occur. At present it is a difficult matter in most States for the breeder or dairyman to purchase cattle for his herd with any assurance that they are healthy. He may have them tested, but there is always a possibility that they have been treated with tuberculin a short time before, and that for this reason they have not reacted. The loss which has fallen upon the breeders of the country through the introduction of tuberculosis in their herds has been tremendous, and it appears that it would be only a proper aid and encouragement to agricultural interests to assist breeders in obtaining animals free from disease. Not only would this encourage farmers to enter into breeding operations, and increase the value of the industry within the State, but the certification of breeding animals would help to build up a market in other States for breeding animals.

(4) In order to encourage the owners of cattle to eradicate tuberculosis, States should allow a reasonable compensation for the animals which it is necessary to slaughter on account of being affected with this disease. It is certainly a matter of great importance to any State to have its herds free from tuberculosis, and its animals and animal

products above suspicion. With the recent demonstration of the communicability of animal tuberculosis to man, a demonstration which has been made by so many investigators, and on such competent authority that the fact can no longer be questioned, there is a disposition on the part of sanitary authorities to scrutinize more carefully those animal products which are liable to be infected. It is, therefore, becoming every day more important for every State to repress tuberculosis within its borders, and in that manner to maintain the reputation of its animal products. Where it is not deemed advisable to provide for slaughtering of all reacting animals with sufficient compensation from the State to make this measure satisfactory to the stockmen, the State may provide for the supervision of herds handled according to the Bang method or some modification of it. For the protection of its own citizens who consume dairy products, if not for the protection of its customers in other States, every State should make some arrangement which would lead to the removal of cows with tuberculous udders, and those suffering from generalized tuberculosis, from herds which supply milk, cream, and butter for human food. This much is essential for the public health, but it would be wise to go further and provide for the slaughter of all cows which show evidence, on physical examination, of being affected with tuberculosis.

(5) In cases where cattle-owners are to have their tuberculous animals slaughtered in an effort to free their herds from disease, the State should further assist them by disinfecting, or at least supervising the disinfection of, the contaminated stables. It is a somewhat difficult matter for persons not acquainted with the practical operations of disinfection to carry out this measure successfully, even after they have been given explicit instructions. It is impossible to impress sufficiently the importance of thoroughness upon persons who are lacking in experience in this line of work. As a consequence, the majority of the premises disinfected by stockmen without the assistance of experts are imperfectly disinfected, and the disease breaks out again among the animals which are subsequently introduced. This is discouraging to the owner, and serves to fix the impression that it is impossible to eradicate tuberculosis. This impression is already widespread, but it is essentially wrong, though it can only be removed by object-lessons in the eradication of the disease under State supervision. There is no reason why tuberculosis should not be eradicated as pleuro-pneumonia was eradicated. The contagion is more widespread, and the expense would be greater, but there are no inherent difficulties to prevent the success of such an undertaking.

(6) When a herd has been freed from tuberculosis by the slaughter of all reacting animals, and the premises have been properly disinfected, the State should further aid the stock-owner by testing without expense the animals which he desires to purchase for renewing his herd. This measure is essential to the success of any plan for lessening the prevalence of this disease, or eradicating it. The expense of testing such animals is almost too great to be borne by the individual, and, moreover, private tests are often unsatisfactory and unreliable.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Sir John McFadyean has again been elected President of the R.C.V.S.

Fellowship Degree.

A meeting of the Board of Examiners for this degree was held on the 27th ult., at 10, Red Lion Square. Two candidates entered for the examination, and the following gentleman passed and obtained the diploma. The examiners were Messrs. J. Malcolm, W. Hunting, and Professor J. Macqueen, Mr. W. J. Mulvey being in the Chair.

Major John Farmer, I.C.V.D.

Fred Bullock, Secretary.

Examinations in London.

At a meeting of the Board of Examiners, held on July 10, for the written, and on and between July 14 and 17 inclusive for the oral and practical examinations, the following gentlemen passed the final examination :—

Mr. W. H. Andrews
,, W. E. Blackwell
,, D. R. Chatterley
,, A. F. Dykes
,, D. Evans
,, H. Gooch
,, G. W. Godwin
,, G. E. Henson
,, C. F. Johnston
,, W. Kennedy *
Mr. S. J. Motton *
,, E. Measures
,, E. McSwiney
,, P. A. McCory
,, D. Okell
,, J. C. S. Powell
,, E. S. Pindar
,, F. M. Reynolds
,, A. W. Shilston
,, W. B. Towell

The following passed the third examination :—

Mr. T. F. Addison
,, A. W. Brasnett
,, E. J. Barrowcliffe
,, G. F. Banham *
,, J. T. C. Bradshaw
,, J. R. Conchie
,, V. S. M. Cope
,, M. Cahill
,, P. D. Carey
,, D. H. Dimes
,, S. A. P. Fewings
,, N. B. Francis
,, A. E. Froggatt †
,, V. Franklin
,, H. W. Good *
Mr. G. N. A. Hall
,, E. C. Lloyd *
,, F. Marks
,, B. Mellon *
,, E. P. Offord
,, V. Pride-Jones
,, R. H. Smythe *
,, G. V. Slynn
,, L. Thompson *
,, F. A. le Poer Trench
,, H. G. Tabuteau-Herrick
,, G. Wacher
,, H. S. Woods
,, T. D. Young

The following passed the second examination :—

Mr. D. S. Beck
,, J. McK. Brown
,, D. A. E. Cabot
,, O. Dixon
,, F. L. Eady
,, J. T. Faithfull-Davis
,, J. A. Gosling
,, B. Gorton
,, J. C. Gaunt
Mr. B. A. Myhill
,, A. V. Nicholas
,, S. C. Rowbotham
,, G. A. Roberts *
,, W. K. Stephens †
,, H. D. Sparrow
,, T. L. Vaisey
,, T. W. W. Wright *

* Passed with second class honours. † Passed with first class honours.

The following passed the first examination :—

Mr. F. G. Buxton
,, V. Boyle
,, R. B. Cockburn *
,, T. J. Davis
,, R. T. Davis
,, J. T. Edwards †
,, G. V. Golding
,, H. E. Hornby *
Mr. F. F. Horton *
,, F. C. Minnett *
,, W. A. Pool
,, E. B. Reynolds †
,, E. J. B. Sewell
,, G. V. Steevenson *
,, B. M. R. West *

* Passed with second class honours. † Passed with first class honours.

Examinations in Dublin.

At a meeting of the Board of Examiners held in Dublin on July 10 for the written, and on and between July 17 and 21 inclusive for the oral and practical, the following gentlemen passed their final examination :—

Mr. B. Hickey
,, B. L. King
,, C. S. Simpson
,, J. Devlin
,, J. C. Doran
,, E. C. Doyle
,, J. J. Hilliard
Mr. J. J. McCormack
,, J. McBirney
,, D. T. Mitchell
,, C. A. Murray
,, F. C. Ryan
,, C. Tracey

The following passed their third examination :—

Mr. J. A. Gibbons
,, A. F. Good
,, M. F. O'Sullivan
,, A. V. Meeke
,, C. Armstrong
Mr. S. H. Ewing
,, W. St. J. F. McCartney
,, O. F. O'Dea
,, A. Snodgrass

The following passed their second examination :—

Mr. R. Devereux
,, T. Doyle
,, C. H. Bryans *
,, P. A. Carroll
,, J. Crowe
,, M. Glynn
,, F. B. Hayes
Mr. T. Hunt
,, A. C. Kirkpatrick
,, H. C. Lowry
,, D. Meadows *
,, W. Nyhan
,, J. F. O'Grady
,, F. J. Sheedy

The following passed their first examination :—

Mr. S. Bradford
,, P. F. Dolan *
,, T. H. Kellett
,, A. O'Neill
,, J. J. O'Neill
,, R. Burriss
,, H. Carbury *
,, J. Evans
Mr. V. Fox
,, R. Marner *
,, P. O'Connell
,, W. O'Donoghue
,, C. W. Raymond
,, F. B. Sneyd
,, N. D. Vakil

* Passed with Second Class Honours.

Examinations in Liverpool.

At a meeting of the Board of Examiners held in Liverpool on July 10 for the written, and on and between July 15 and 17 inclusive for the oral and practical, the following gentlemen passed their final examination :—

Mr. E. J. Burndred
Mr. Thos. Woods

The following passed their third examination :—

Mr. J. A. Griffiths
,, R. Hopps
Mr. R. J. Little

The following passed their second examination :—

Mr. J. R. Barker *
,, E. L. Butters
,, W. A. Dykins
,, H. Heyes
,, C. W. Makinson *
,, T. G. Millington
Mr. P. McGregor
,, Wm. Oldershaw
,, H. Quiggin *
,, F. J. Richmond
,, W. Taylor *

The following passed their first examination :—

Mr. Thos. Craig *
,, C. Holland †
,, G. G. Howard *
Mr. W. P. Stokes
,, J. L. Williams

* Passed with Second Class Honours. † Passed with First Class Honours.

Reviews.

THE PRODUCTION AND HANDLING OF CLEAN MILK. By Kenelm Winslow, M.D., M.D.V., B.A.S. (Harv.). Royal 8vo., pp. xvi + 207, with 88 illustrations. Published by Messrs. Baillière, Tindall and Cox, London; and Messrs. William R. Jenkins and Co., New York. Price 10s. 6d. net.

This little book comes at a very opportune moment, when so much is being said about the value of a clean milk supply. The author says the farmer is apt to receive more than his share of blame for the insanitary condition of most market milk. He is probably right, for no matter what care the farmer takes, the milk is undoubtedly contaminated enormously after it leaves his hands. There is no necessity to give the average dairy farmer an undue share of blame, for if he bears his own share he has quite as much as he can manage. But we do sympathize with the poor cow who gets unjustly blamed for almost every malady which fond parents imagine can possibly have been transmitted to children by the milk supply. With the exception of tuberculosis, practically all milk-borne diseases are due to contamination of the milk after it leaves the cow. We are told on p. 20 that "Cow-pox, milk-fever, anthrax, and pleuro-pneumonia in cows have been conveyed by the germs of these diseases, in their milk, to human beings." That is a statement of fact which we find very difficult to believe with reference to milk-fever and pleuro-pneumonia. In the first place, it has not been satisfactorily demonstrated that milk-fever is due to a germ. In the second place, we know of no evidence to show that either of these two diseases is transmissible to man. If the author knows of authentic cases, we should be glad to hear of them and to know the nature of the affections in man. We admit that milk from cows suffering from milk-fever or pleuro-pneumonia may be undesirable for human food, but it is a long step from that to agreeing that milk-fever and pleuro-pneumonia of cows may be set up in the human being.

The main point of the work, however, is to assist anyone wishing to undertake or to compel the production of clean and wholesome milk, and the author has succeeded admirably in his attempt. Farmers and dairymen will gain much, and in many ways, by following the advice given. Undoubtedly cows kept under sanitary conditions will thrive better than cows kept in dirty surroundings, and it is the thrifty

cow that gives the best account of herself in the dairy. The principles of feeding for milk production are referred to, and suitable rations quoted. The Hegelund method of milking, preceded by manipulating the udder in a special way, is said to considerably increase the yield of milk and butter fat. The method is described very lucidly, and admirably illustrated by six plates.

Sanitary authorities will learn much from it to assist them in drawing up regulations for the control and inspection of dairies. And to crown all, laymen reading this work will get such an insight into the present system of production of milk that they will insist on a pure milk supply, and be prepared to pay for it.

We commend this book to all who are either directly or indirectly connected with the milk supply. The printing and binding are good.

Translations and Extracts.

SIDE-BONES IN THE HORSE'S FOOT.

BY DR. K. WITTE.

From certain statistics that he has collected, Dr. Witte gives the following figures. The percentage of side-bones were: In heavy horses working on hard roads at a quick pace, 94·4 per cent.; in light horses, 83 per cent.; in the same class worked at a slow pace, 75·8 per cent.; and in cavalry troop horses, 7·5 per cent.

Side-bones usually appear at between 8 and 12 years of age; they are uncommon among young horses. The author has never seen a case in an animal under 4 years of age.

The most frequent cause is lorry work on hard ground, and they are more common in the fore than the hind limbs, and in the external than the internal cartilage.

The first changes are seen in the apophysis of the bone, the tissue becoming red and changing in its consistency. The change of colour commences in the deep parts of the bone in patches extending towards the cartilage; at the same time the bone tissue at these points shows all the characteristics of rarified osteitis or inflammatory osteoporosis. This condition is at first confined to the vascular foramina, but gradually extends in triangular patches, the red colour of which contrasts strongly with the yellow of the cartilage, and into which it extends. The bony tissue becomes more and more intimately connected with the cartilage and extends both forwards and backwards. The cartilage becomes thickened, solid and roughened, gradually assuming the appearance of bone. There is a growth of osteophytes, and cavities form in the substance. In cartilages that are undergoing transformation it is not uncommon to find fissures running in different directions like fractures, but with rounded and smooth edges.

Certain authors look on them as evidence of several different centres of ossification (Gutenäcker, Pritchard, and Lungwitz), but the author does not hold this opinion.

The microscopic appearance of the tissue, in his opinion, confirm those of Blanc and Eberlein that there is primary inflammation of the bone, and that in the cartilage is secondary.

(*Monatshefte für praktische Tierheilkunde.*)

HEART BONES IN CATTLE.

BY VETERINARY SURGEON LADANYI.

THE author has produced a great work on the heart bones of cattle. Some of them are here illustrated. Figs. 1 and 2 are boot-shaped heart bones ; *fsz* denotes the upper edge, which serves as a base to the valve, *asz* the under edge, *mf* the anterior surface, *fa* the ramus

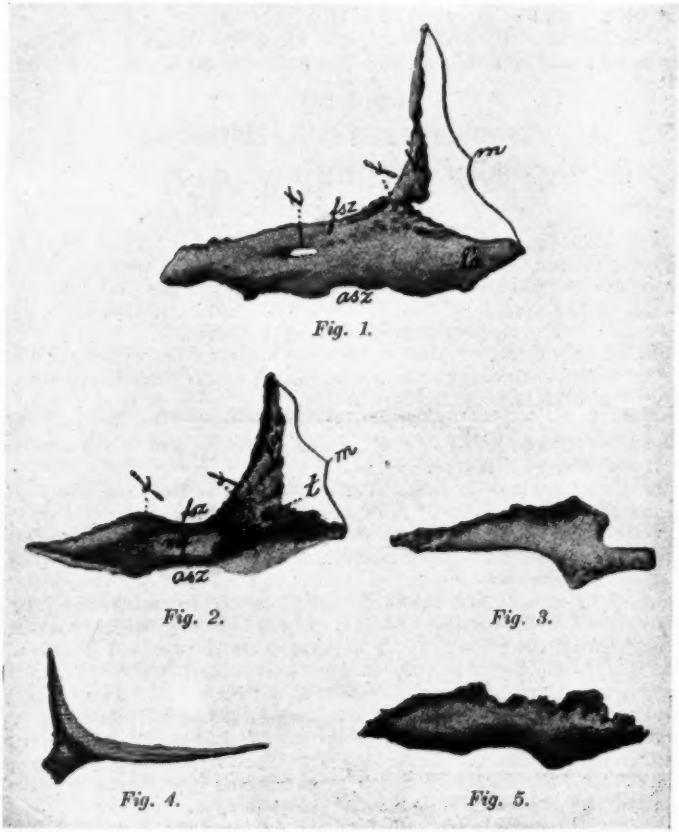


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

ascendens, *la* the ramus descendens, *t* is a nutrient foramen, *f* the centre of growth of both bones, in adhesion of the mitral. Fig. 3 is a last-shaped heart bone, in which *msz* represents the anterior and *hsz* the posterior edge. Fig. 4 is a spur-shaped heart bone.

PARTURIENT PARESIS IN A MARE—RECOVERY.

BY L. G. MARSHALL, V. M. D., ROME, BRADFORD CO., PENNA.

In May, 1907, I was called by Charles Easterbrook, a farmer of Rome, Bradford County, Pa., to see a brown mare, aged 12, 16 hands high, weight 1,250 lb., in good condition, and the mother of a colt one day old; the colt was strong and active. I saw the mare at 7 in the morning; she was down, unable to get up; the owner said she was all right the night before. Her temperature was 101°, respiration quiet, owner said she was a regular breeder and was always a big milker until now, and this time the milk dropped until three days before she had her colt, and now there was hardly any milk in the udder. After the examination of the mare, and with the history that she was a regular breeder and in the prime of life, I concluded she had "milk fever," or parturient paresis, and gave her oxygen treatment and 1 grain of strychnine. That is, she was treated as a cow with "milk fever." This was 8 in the morning, and the treatment was repeated at 11 and 11.30 a.m. She then got on her feet with very little assistance, but seemed very weak at first, but after standing three minutes or so and after she was rubbed, she gained strength and acted very well; ate a quart of oats and took some water and seemed bright, so we went to dinner and left her alone. When we came out we found her down, but as we came into the box she got up as handy as any horse and walked over to the hay and started to eat, and we concluded she was out of danger. The owner had had cows with milk fever, so he knew the disease pretty well and we felt sure of the diagnosis. I went home, and telephoned him in the evening, and he said the mare was all right, but in the morning he called me at 5 a.m., and said the mare was down the same as before. I saw her at 6 o'clock, and started in and treated her the same as the day before, filling the udder with oxygen and giving a grain of strychnine, and obtained the same results, so I felt confident that the treatment was right, and concluded that it had not been carried out as long as it should have been, for the udder of a mare is small and there is not sufficient space to hold a good amount of oxygen. So on the second day I was more thorough, but it took a little longer to get her up than it did the first day. I think we had her up at 1 o'clock, but she gained strength very fast, and at 3 o'clock she looked so well I thought she was safe to leave. I telephoned in the evening, and they said she was doing fine, but wouldn't own the colt, and said they had the colt in with her, but had to keep a man there to keep her from killing the colt, and she had not any milk. I had already instructed them how to feed the colt on cow's milk, and told them to continue feeding the colt in that way for a few days. They stayed up until midnight, and turned the colt in a separate stall. The mare was in good condition when they left the stable. In the morning at 4.30 they found the mare down and unable to get up. This was the third time, and I was called at 5 o'clock and went to see her, and found her much worse than at any time before. The first and second time I saw her she could roll up on her sternum and turn her head to her side most of the time, but this time she was down on her side and unable to raise her head; temperature 100·8° It looked very doubtful as to whether we could revive her, but we

gave the same treatment again and worked faithfully, although without much hope of success, from six in the morning until noon; then I sent the owner after my slings, and while he was gone I saw she was gaining a little. Her sense of feeling improved, and at three o'clock she got up by a little of my assistance and from that time improved very fast, and when the owner returned with the slings she was better than she had been in three days. I stayed over night, and inflated the udder with oxygen several times during the night. The mare came out all right and raised a nice colt.

I think if we had carried the treatment out longer and more thoroughly the first day she might have escaped the second attack.

(*American Veterinary Review*).

HERPETIC DIATHESIS IN THE DOG—OBESITY SIMULATING ASCITES.

BY M. L. MAGNIN, VERSAILLES.

I WAS called to see a smooth-coated mongrel house-dog, aged 3, belonging to Monsieur B., of Saint Menehould (Marne), in the autumn of 1888. I found him excessively rotund, his true form being obscured by great rolls of adipose tissue, abdomen pendent, resembling that of an animal suffering from ascites (decanter or pear-shaped disposition). There was fluctuation, but whether true or false seemed difficult to determine. In his actual state the animal was incapable of running about; he did not even take any exercise; as soon as he moved about he began to pant. He was always thirsty. As the presence of liquid in the abdomen appeared doubtful, an exploratory puncture was made, M. George, my *confrère*, being in attendance; there was no result.

We found a lipoma or spreading layers of fat around different organs of the abdomen. Under the influence of a strict diet the dog shrank a little in the following months; however, his abdomen remained the same. Superficial wounds arose on the members and buttocks as a result of the general state of the animal.

The dog, not doing any good, was destroyed on February 2, 1889, M. George assisting at the autopsy.

The mesentery was one mass of fat, several centimètres thick, with intestine coiled up in it. One could only see the convex border of this. No liquid in the peritoneal cavity, but fat in thick rolls, especially in the case of the mesentery, which was thick and voluminous, weighing on the abdominal wall, which was also only a mass of adipose tissue. The liver was three times its normal size, friable, especially on the right side, appearing as if cooked, and of a yellow colour. No blood flowed on section, and it seemed almost bloodless. Tissue easily crushed by the fingers. The animal, the subject of this observation, was a beautiful type of herpetic.

(*Revue Générale de Médecine Vétérinaire.*)

RADIAL PARALYSIS.

BY M. L. MAGNIN, VERSAILLES.

MM. CADIOT and ALMY consider this accident of frequent occurrence in the horse. I have, however, only observed one such case in my career, and the circumstances under which the paralysis occurred are precise enough to merit succinct relation.

On May 6, 1896, the third squadron of the 18th Chasseurs, then in garrison at Epinal, was doing customary manœuvring work. After galloping they were rested a few minutes. At the moment of remounting the chasseur riding the mare Arquebuse, aged 13, found, to his astonishment, that it was impossible for her to advance.

Symptoms.—Weight supported by all four legs, but the off fore could not be advanced to make a step; it remained behind, and would not move in any way. It seemed as if the animal could only move it by dragging it on the ground. Before a step could be taken it had to be pulled forward by one man, whilst another man urged the animal on behind. In this way the mare Arquebuse gained the infirmary situated 300 metres away.

There was sensibility on pressure near the right humero-radio-cubital articulation. Sensibility did not appear deadened at the level of the extensors of the metacarpus. Diagnosis was easy. It appeared probable that there had been a bruising of the radial nerve during the galloping time that preceded the rest.

Treatment.—Absolute rest and friction, with tincture of cantharides. Two days later the paralysis commenced to disappear, and on May 15 the animal scarcely dragged the right toe on the ground at the trot.—G. M.

(*Revue Générale de Médecine Vétérinaire.*)

TUBERCULOSIS OF THE RETRO-PHARYNGEAL LYMPHATIC GLANDS OF THE OX.

BY M. L. SPARTZ, DIRECTOR OF THE LUXEMBOURG ABATTOIR.

EVERY bovine that coughs is suspected of tuberculosis by the public, the cough being generally caused by tuberculous lesions on the internal face of the thoracic cavity. Tuberculosis of the upper respiratory passages is, however, rarely indicated in veterinary medicine, and the text-books contain but little information on tuberculosis of the glands of the head. This omission is very natural, as in inspection the guttural and retro-pharyngeal glands are not minutely incised. In order to cut into the retro-pharyngeal ganglia the inspector must disfigure the head of the animal a little, and detach the tongue from its depths. The butcher is generally hostile to this, as the beautiful clean aspect of the head is thereby spoiled, and after the operation it appears slashed.

If the two retro-pharyngeal glands are regularly examined—a rule followed by us for some time—tuberculosis is more frequently found than in the guttural or other intermuscular ganglia. This tuberculosis is generally local; that is to say, the bacilli have penetrated there

directly by the lymphatics of the pharynx, and have not been brought there by the blood-stream.

Tuberculosis of these ganglia or glands is encountered very often in animals little suspected of pulmonary tuberculosis, and sometimes such animals present no lesions of the disease in any other part of the body, neither in the organs and serous tissues, nor in the ganglia. The lesion is seldom found in animals suffering from a generalized affection. In these animals, even if the intermuscular ganglia are crammed with tubercles, it is exceptional to find tuberculosis of the guttural and these retro-pharyngeal ganglia.

In twenty-eight animals presenting lesions of the retro-pharyngeal glands during the months of August and December, 1907, the characters of these lesions were as follows :—

August.—Of five animals, two presented tuberculosis of the lungs ; one presented tuberculosis of lungs, liver, and intestines ; one presented tuberculosis of lungs and intestines ; one did not present lesions in another part of the body.

September.—Of seven animals, four presented tuberculosis of lungs, liver, and intestines ; one presented tuberculosis of lungs and intestines ; one presented tuberculosis of thymus, lungs, intestines, and first cervical vertebra ; one did not present lesions in another part of the body.

October.—Of six animals, one gave tuberculosis of lungs and intestines ; two gave tuberculosis of lungs ; three did not present lesions in any other part of the body.

November.—Of six animals, four gave tuberculosis of lungs, liver, and intestines ; two gave no lesions in any other part of the body.

December.—Of four animals, all gave tuberculosis of the lungs.

Clinical Symptoms.—In the least evident form, if tubercular infection is not indicated externally by deformity of one or both parotid regions, the affection is characterized by a strong, not wheezy, frequent cough. This cough does not present the classic character of that in an animal riddled with extensive tuberculosis. The animals are fat ; have bright eyes, not retracted in their sockets ; the chine and the loins are fat-laden. Tuberculous glands act on the mucus of the pharynx like a foreign body. The animal coughs as much in a hot stable as in the cold air ; the cough is not provoked by ingestion of cold drinks, by a blow on the thorax, forced walking, or a quick rush into the cold air. This strong cough, not occasional, but frequent, is the only clinical symptom, for the glands are not generally examined while the animal is on its feet.

In certain cases, however, if tumefaction has reached the size of an egg or even of a fist, it exhibits itself externally by deformity of the inferior parotid region. This tumour—attached deeply—is indolent, uniformly hard, the skin movable over its surface, and at first sight one may imagine it to be a deep actinomycotic tumour. Absence of fistulas and of the characteristic pus will quickly settle the matter.

In the normal state the retro-pharyngeal glands, forming two little more or less rounded bodies of a length of from 2 to 3 cm. and of a thickness of 1 to 2½ cm., do not project into the lumen of the pharynx. If the gland is tuberculized it increases in size, and constantly excites the nerve terminations.

The affection being primary, I confine myself in practice to excising the affected gland without incising the neighbouring tissues, for I have never found a cutaneous, osseous, or muscular tuberculosis in the head.

This notice is to call the attention of my *confrères* to a lesion frequent enough, but which passes unperceived if the examination is not complete.—G. M.

(*L'Hygiène de la Viande et du Lait.*)

THE PATHOLOGICAL ANATOMY AND TREATMENT OF OBSTRUCTION OF THE TEAT IN THE COW.

BY HUG.

In a paper published in 1904 "On the operative treatment of deformed teats in the cow," *Revue Générale de Médecine Vétérinaire*, November 1, 1904, vol. iv., p. 474, the author gave some statistics and remarks on the pathology of this condition. He now, in a pamphlet of 50 pages, with a number of figures in the text, remarks on their clinical symptoms, microscopic appearances, pathology and treatment.

His conclusions are founded on statistics collected in 1907. Out of 136 cows, 121, or 88·9 per cent., of the obstructions were in the canal. Only fifteen, or 11·1 per cent., were in the galactophorous sinus. Of the first, 106, or 87·6 per cent., were congenital, and fifteen, or 12·4 per cent., were from external causes.

Among the obstructions in the galactophorous sinus, six, or 40 per cent., were of congenital origin, and nine, or 60 per cent., from various causes, such as thickening of the walls, polypi, &c.

The author divides obliterations into three classes:—

(1) Those caused by congenital malformation.

(2) Those due to alteration in the lining mucous membrane brought about by catarrhal inflammation.

(3) Those caused by neo-formations of traumatic origin. He has never seen obliteration from traumatic causes pure and simple; there are always complications.

In stenosis of the canal, that causes cows to be difficult to milk, the cause is elongation of the middle and internal zones of the wall of the teat, and it is almost always congenital.

Treatment consists of a surgical operation to dilate the canal at the upper part by a longitudinal incision made from above downwards by a special form of knife (*vide Revue Générale de Médecine Vétérinaire*, November 1, 1904, vol. iv., p. 475), and if asepsis is observed it will heal without granulatory or new formation of cellular tissue, the epithelium spreading over the wound.

Bougies and milk syphons are not only dangerous but useless, the passage of the milk dilating the canal sufficiently.

The udder and teats should be carefully examined before the operation, and if there are the slightest signs of inflammation it should be deferred.

(*Schweizer Archiv für Tierheilkunde.*)

METACARPAL OSTEITIS IN THE HORSE.

BY PROFESSOR LEBLANC.

THE disease is more common in cab and job masters' horses than any other class, and rarest in heavy draught animals. M. Drouin considered that it was caused by over-extension of the ligaments, but this theory, in the author's opinion, is untenable. He is inclined to look on it as being caused by infection, the overworked horse being specially liable to suffer from the effects of infectious germ, carried by the blood, with the result that osteitis is the result.

A case that recently came under M. Leblanc's notice seems to support his theory. A horse had been driven at a quick pace for 40 kilometres; when returned to his stable he had all the appearances of acute attack of laminitis. From this he gradually recovered, but the near fore leg below the knee was swollen and painful, and in a short space of time a large exostosis formed outside the knee.

The author looks on this case as proving his point, and uses the term "metacarpal laminitis."

(*Journal de Médecine Vétérinaire et de Zootechnie.*)

OSTEITIS OF THE THIRD PHALANX.

BY M. LEBLANC.

MM. HURET and JOLY have drawn attention to the frequency of this disease of the feet, which, although its existence is denied by some, is, in their opinion, quite as common as navicular disease.

In some cases the bone retains its shape and size, and the foot, to outward appearance, is not altered. The bone, however, is altered in structure, becomes spongy in character, riddled with holes, fragile, and easily broken. In other cases it is altered in shape and diminished in weight, and greatly deformed, depending on the severity of the inflammatory process.

Heredity.—Youth and bad food are both predisposing causes, also flat splay feet with low, weak heels, as in such the concussion is violent, also badly fitted shoes with false bearing. Working when too young, and overwork, are also a fruitful cause, but the author thinks that the most frequent of all is infection.

A great number of observations in both men and animals show that bone can be infected through the blood-current in exactly the same way as other tissues are.

Acute osteitis of the third phalanx resembles laminitis in all its symptoms, but they disappear with appropriate treatment, and the foot does not alter in size or shape.

In the subacute or chronic form the lameness is often intermittent, and the hoof becomes deformed, the front of the wall sinking in, the heels unequal in height, and the sole sunk. When at rest the horse pants, but there is no pain on pressing over the frog, as is the case in navicular disease. In some cases ring bones and side bones form, and the

heels contract, but in an irregular manner. This the author looks on as a diagnostic symptom.

The disease can be differentiated from navicular by means of Lungwitz's test with the wooden wedge, but prognosis is always bad. Treatment is the same as for navicular disease.

(*Revue Générale de Médecine Vétérinaire.*)

TREATMENT OF FISTULA OF STENSON'S DUCT WITH AMMONIA.

BY JOSEPH BUTTICE, FAVARA, ITALY.

THE patient, a mule, aged 9, was brought to the author on August 15, with a wound on the cheek that had been caused by a bite two months previously. The owner noticed that when feeding a quantity of fluid escaped from the opening and flooded the manger.

A salivary fistula was diagnosed, and destruction of the parotid gland advised. It was decided to do this by injecting ammonia into it through the open duct. This was done by means of a 6 cc. Pravaz syringe; the animal not being thrown, a twitch was put on. After 30 cc. of ammonia had been used, the gland was fairly tense, and was massaged, to disperse it. The flow of saliva from the fistula at once stopped. In about thirty-six hours afterwards the whole part was much swollen, and it was necessary to scarify the skin. There was considerable sloughing, but the wound healed in about a month.

Many different drugs have been recommended for destroying the parotid gland: nitrate of silver (Perceval), creosote (Bassi), ethylic alcohol (Bassi), tincture of iodine (Pellegrini-Meltzbach), petroleum (Trinchera), &c. Ethylic alcohol was used by Professor Bassi in 1873, and Mongiardini published some notes about it in the *Riforma Veterinaria* for August, 1898.

In the same journal (1899) Curico also relates a case. In this, however, he ligatured Stenson's duct and injected the ammonia into the gland through the skin. Ammonia seems to have been first used for this purpose by Haubner in 1849, and appears to have several advantages over the other drugs just mentioned. It at once stops the discharge of saliva, as it deprives the tissues of the gland of water, and induces a croupal inflammatory process. A single injection is sufficient, and there is no necessity to throw the animal. In his work on Surgery, vol. ii., p. 356, Sangillotti-Buonsanti says that the quantity of ammonia to be injected should not be less than 20 to 30 grammes, according to the size of the animal, and should not exceed from 400 to 700 grammes.

The author points out that these doses are a great deal too large, and that, as 30 grammes in his case caused sloughing, the effects of 400 to 700 would be disastrous, and he thinks that 30 grammes is the maximum that should be used.

(*Revue Générale de Médecine Vétérinaire.*)

AN UNUSUAL PATIENT.

BY SCHOLTZ.

THE author was called in by the proprietor of a circus to attend a large 7-year-old male elephant. The animal was unable to put his right fore foot to the ground, holding it up in the air and moving with difficulty and great pain on three legs. The animal appeared to understand that the author's object was to afford him relief, and raised up his foot as if to attract his attention.

The limb appeared to be swollen in the front of the fore arm, but it was difficult to locate anything; the skin was, however, corrugated into folds at this part, which was not the case on the opposite leg. The elephant would not allow the part to be touched, pushing the author's hand away with his trunk when he attempted to touch it.

The animal had done a hard day's work the day before, and seemed to be all right, but was found in this condition in the box he had been placed in on the following morning. He had been stabled for the night with another pygmy elephant which, no doubt, was the cause of the accident.

Twelve pounds of ice were put into a sack and hung over the ears so as to come in contact with the shoulder. The animal seemed to appreciate the relief, and from time to time pressed the sack against his skin with his trunk.

On the second day he had greatly improved, and was able to bend and move the limb, which he constantly did. A stimulating embrocation was applied by means of a wooden rolling-pin moved lightly up and down the leg, which the animal did not seem to resent. On the sixth day he had completely recovered.

(*Zeitschrift für Veterinärkunde.*)

STINGING-NETTLE POISONING.

BY HEINRICH HOTTERBACH, VETERINARY SURGEON, OFFENBURG.

THE French military veterinarian, Major Rohr, mentions a mishap seldom related in literature, not because it actually occurs unfrequently but because it is not often recognized. I refer to poisoning by the common nettle (occurring especially in dogs of the chase).

In the months of September and October, 1905, ten hounds and some ferrets in the neighbourhood of La Fère suddenly died with all the symptoms of acute poisoning, and the huntsman sent the stomachs and intestines to the laboratory of the Faculty of Medicine, in Paris, for analysis. There it was stated that the cause of death must be sought in acute poisoning by stinging-nettles. A poisoning of quite a different nature was suspected, namely, strychnine poisoning by poachers. It was then remembered that the hounds in their zeal had searched a clump of nettles that had been battered about by an August hail storm, had risen up again, and at the time of the hunt was shooting up luxuriantly. Rohr conducted different experiments to clear up the matter and then said, "the young shoots of *urtica dioica* can cause a very acute poisoning in dogs and ferrets, and smooth-haired dogs especially are liable to suffer." Further he writes: "If

the dogs press through the nettles and the stinging hairs penetrate the skin (especially on the abdomen and feet) he will experience an unbearable burning feeling and begin to lick himself. The hairs will be carried into the mouth and excite a violent inflammation there which will extend to the pharynx, also the upper air passages will under circumstances (hot breath of the dog in the heat of summer) be reached by the hairs, their mucous membrane become swollen, respiration troublesome, and dyspnœa and asphyxia arise."

This short statement seems to me rather misleading, and I think I can give a better explanation of the matter and will commence by giving an account of the anatomical structure of a stinging hair.

The stinging bristles are recognizable as fine hairs loosely attached to the leaves and stalk of the nettle, a layer of two strata of cells forming the union; it is quite evident that this connection must be severed on the slightest pressure away from the stalk. Away from the stalk! If towards it, then the bristle lies in the direction of the stalk, forming a very narrow angle with it, and this occurs without breaking the connection, and the hair rights itself again when pressure is removed. This breaking away of the hair will be the more easily understood as the bristle is much hardened, and therefore possesses a great degree of brittleness. This matter of hardness is further important because at the point of the bristle there is a cutting edge, which facilitates penetration of the skin. The button-like head of the hair is nicked, and just narrow enough to break off as soon as the skin is punctured. Then the canal (possessed by each hair) is opened, and the contents in the form of a clear fluid contained in a bladder-shaped swelling gushes into the wound. Such is the mechanism of nettle poisoning, and it is simple and clear.

The chemistry is more complicated. It has been known for a long time that the stinging-nettle contains formic acid. This is only one constituent part of the poison which fills the bladder-shaped swelling —and indeed it is the harmless constituent. It causes the burning feeling experienced from the sting of a young, sappy nettle. Older shoots appear to lose their stinging qualities, and to be harmless. But if one notes the very strong reaction resulting from the sting of a single hair, and further considers that the contents of the bladder-shaped swelling, a tiny and hardly measurable quantity, is answerable for this effect, then one must come to the conclusion that an extraordinarily powerful poison must be at work, a poison that in the smallest dose can occasion violent inflammation. And, indeed, investigations into the chemistry of plants has shown that, besides formic acid, there is a venom nearly related to a poison found in one of the snake tribe, and perhaps the identical ferment (enzyme) is contained in the clear fluid of the reservoir in the hair, and this ferment causes the violent inflammation which one can never satisfactorily attribute to formic acid. Besides, it is known that in the Tropics (apart from snakes) the stinging-nettles (*urtica stimularis* in Java, *urtica crenulata* in India, and *urtica mentissima* in Timor) cause violent symptoms directly resembling snake bite, scarcely less dangerous, feared as much, and leading in a short time to paralysis and death.

Thus the method of stinging-nettle poisoning is made plain. It is not local, caused by the puncture of the hair, leading to inflammation and death, nor to a swelling of the air passages causing asphyxia.

This is too naïve, and will not satisfy the claims of science. There is a general poisoning due to the penetration of a dreaded venom into the juices of the body.

Is nettle-poisoning common? This is a question which I cannot answer. To the veterinary surgeon who spends his days in a busy, difficult, and badly-paying practice the luxury of a well-equipped library is seldom possible. In the literature accessible to me I find nothing to answer my question. I must believe that stinging nettle-poisoning is rare, or rather assume, what is probably nearer the truth, that it is seldom recognized. That poisoning has occurred is in most cases evident, yet anamnesis and section only furnish a riddle. I remember such a case in which I could not make out the character of the affection and its ætiology. It was in a hound. Since the announcement by Rohr I feel sure it was a case of stinging nettle-poisoning. A young (8 months old) German terrier was brought to me after the hunt in a moribund state with the history that the animal has done his work well, and was all right till midday. At 5 o'clock he was missed. As the day was very hot (September) he was sought at a fox's hole at which the last hunt had finished, under the impression that he would be there, fagged out. At 6 o'clock he was brought in by peasants; they found the dog lying on a field, he could only stagger along, and was seized with cramp, and always fell on his side. He had lost all use of his muscles. Pupil expanded to the maximum, gaze fixed; head could not be held up, and if raised, fell with a bang to the ground. Spasms not present. Slimy saliva from the mouth. Breathing slower and slower, and death occurred in 15 minutes.

Post Mortem.—Mucous membrane of the mouth and pharynx were diffusely reddened and slightly swollen. The mucous membrane of the stomach and œsophagus quite normal. Both lungs greatly congested; pericardium contained much fluid. Otherwise no changes in thorax, abdomen or pelvis. Skinning of the animal was not undertaken, nor was the carcase sent to a laboratory. I attributed the cause to "poisoning with some substance eaten," and thought perhaps the dog had picked up some poisonous worms. In my day-book I put down, "Cause of death surely a poison. But what? Perhaps a snake-bite?"

Rohr's article has made me think. I feel sure I ought not to overlook the possibility of nettle-poisoning in such a doubtful case.

A word as to therapy. Hypodermic injections of camphor and potassium permanganate per os (1 per cent. solution) are indicated.

(*Ex Berliner T. W.*)

G. M.

OBITUARY.

JOHN CONNOCHIE, M.R.C.V.S., Ayton, Berwickshire; graduated December, 1891, New Veterinary College, Edinburgh. A correspondent writes: "Mr. John Connochie was a born Veterinary Surgeon. This was early manifested, so that after seeing practice with his father he proceeded to the New Veterinary College, Edinburgh, where he obtained many medals and special honours, and passed his final examination before becoming of age. Mr. Connochie was an ex-President and an ardent supporter of the Scottish Metropolitan Veterinary Medical Association. He was very successful as a practitioner, and in private life was kindness itself. He will be sadly missed by all who knew him."

Correspondence.

To the Editor of the VETERINARY JOURNAL.

INCORPORATED SOCIETY FOR THE DESTRUCTION OF VERMIN.

DEAR SIR,—It affords me great pleasure to inform you that this Society is now duly incorporated, and that its registered offices are at this address. It will be readily understood that the Society is now free to devote its attention to the objects for which it was constituted, and which are set forth in the enclosed revised statement of policy.

The Central Executive Committee, at their meeting on June 26, determined to hold, next May, an Exhibition of all the various methods of vermin destruction.

(2) To hold a discussion on the *rôle* played by vermin in the dissemination of disease, at the offices of the Royal Society of Medicine, on July 22 or 23.

(3) To publish a monograph on the House-Fly.

(4) To publish a Journal, the first number to be issued on October 1.

(5) To grant certificates to *bona-fide* rat-catchers (holding examinations if necessary) in order to protect the public from unscrupulous persons, and to encourage vermin destruction in a more efficacious manner.

As it will be necessary to call a statutory meeting of the members next month, it is imperative that the compilation of the Register of Members should be proceeded with at once, and members who have not filled in their forms are earnestly requested to do so as soon as possible. Finally, the Committee would be greatly obliged if members would forward to the Secretary the names of friends who are likely to be interested in the work of the Society; for it is only by the co-operation of each of its members that a Society having such an extensive field can hope to achieve its object, and have its finances in a healthy condition.

Yours faithfully,

95, Wigmore Street,
London, W. *July* 11, 1908.

A. E. MOORE,
Secretary.

To the Editors of the VETERINARY JOURNAL.

DEAR SIRS,—In the article on "Local Analgesia," by Professor Arthur Barker, which appeared in the June number of the VETERINARY JOURNAL, mention is several times made of a synthetic adrenal preparation. On p. 297 it is referred to a "synthetic adnephrin," and on pp. 298 and 299 as "synthetic epinephrin."

As this nomenclature is likely to lead to much misunderstanding on the part of your readers, we shall feel indebted to you for inserting this letter in your next issue.

There is only one active adrenal substance built up by chemical synthesis, and this was discovered in the chemical laboratories of the Farbwerke vorm. Meister, Lucius and Brüning, at Hoechst-on-Main, Germany, who are the sole patentees, and who have given it the name "Synthetic Suprarenin." An advertisement of this preparation appears on p. xi. of the June number of your journal.

Synthetic suprarenin is an improvement on all the natural adrenal preparations owing to its absolute purity, constant reliable action, and great stability of its solutions, while individual doses may be sterilized before use by boiling. We shall be pleased to supply any of your readers with a sample free of charge on their applying to us.

Yours faithfully,
pro Meister, Lucius and Brüning, Ltd.,
51, St. Mary Axe, E.C. J. KÖHLER.

Books and Periodicals, &c., Received.

Friedberger and Fröhner's Veterinary Pathology. Authorised Translation by M. H. Hayes, F.R.C.V.S. Two vols., revised and enlarged, 21s. net. (Hurst and Blackett.) The Psychology and Training of the Horse, by Count E. M. Cesaresco. 10s. 6d. net. (T. Fisher Unwin.) The Tropical Agriculturist (Ceylon). American Veterinary Review.

Letters and Communications, &c.

Mr. D. Chatterley; Mr. C. Elphick; Mr. A. Hodgkins; Mr. C. W. Townsend; Mr. H. Brassey-Edwards; Mr. J. Cameron; Mr. G. Mayall; Mr. F. Bullock, Royal College of Veterinary Surgeons; Mr. C. Roberts; Mr. J. Köhler; Board of Agriculture; Department of Agriculture and Technical Instruction for Ireland; Captain Farmer.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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THE LATE MR. FRANCIS WHITFIELD WRAGG, F.R.C.V.S.
Treasurer and Past President of the Royal College of Veterinary Surgeons.